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NATIONAL BISON RANGE
NINEPIPE REFUGE
PABLO REFUGE

Refuge Narrative Report Calendar Year 1969

UNITED STATES DEPARTMENT OF THE INTERIOR

Bureau of Sport Fisheries and Wildlife Fish and Wildlife Service Moiese, Montana

NATIONAL BISON RANGE

Refuge Narrative Report

Calendar Year 1969

PERMANENT PERSONNEL

Marvin R. Kaschke, Refuge Manager

Robert L. Barber, Assistant Refuge Manager (E.O.D. 01/12/69)

Victor B. May, Refuge Maintenance Foreman

Grant Hogge, Heavy Duty Mechanic

Ernest W. Kraft, Maintenanceman III Sharon A. Scammon, Clerk-Typist

Edward G. Krantz, Maintenanceman I, WAE

Robert L. Middlemist, Maintenanceman I, WAE

William J. Lampshire, Maintenanceman I, WAE

Steven P. Hedges, Student-Trainee

TEMPORARY PERSONNEL

Robert L. McVey, Laborer
Wayne A. Wetzel, Laborer
Monica C. Pederson, Work-Study Employee
Nancy A. Larum, Work-Study Employee
Cecil D. Barnier, Work-Study Employee
David L. Knudsen, Work-Study Employee
Richard D. Borden, Work-Study Employee
Cindy Doty, NYC
Carol Sullivan, NYC
Stuart Howell, NYC
Jim Joscum, NYC
George McLeod, NYC
Stanley Perry, NYC

TABLE OF CONTENTS

1.	GENERAL	Page								
	A. Weather Conditions	1								
	B. Habitat Conditions	1								
II.	WILDLIFE									
	A. Migratory Birds									
	l. Waterfowl	2 3 3 3 3								
	2. Other Water Birds	3								
	3. Shorebirds	3								
	4. Mourning Doves	3								
	B. Upland Game Birds	3								
	C. Big-Game Animals 1. Buffalo	,								
		4 7								
	2. Elk	8								
	3. Mule Deer	8								
	4. White-tailed Deer	9								
	5. Bighorn Sheep	9								
	6. Antelope									
	7. Rocky Mountain Goat	10								
	8. Longhorn Steers	10								
	9. Black Bear Badanta and ather Mannala	10								
	D. Fur Animals, Predators, Rodents and other Mammals	10								
	E. Hawks, Eagles, Owls, Ravens, Magpies	II								
	F. Other Birds	11								
	G. Fish	12								
	H. Reptiles	12								
	I. Diseases 1. Buffalo	12								
	2. Elk and Deer	12								
	3. Bighorn Sheep	13								
	4. Antelope	13								
	д инеторе									
III.	REFUCE DEVELOPMENT AND MAINTENANCE									
	A Physical Davolopment									
	1. Refuge Work Programs	13								
	B. Plantings	16								
	C. Collections and Receipts	17								
	D. Control of Vegetation									
	1. Biological Control	17								
	2. Chemical Control	17								
	E. Planned Burning	17								
	F. Fires	17								
IV.	RESOURCE MANAGEMENT									
	A. Surplus Buffalo Disposal									
	1. Live Disposal and Meat Sales	19								
	2. Sale and Donation of Hides and Skulls	19								
	B. Surplus Elk and Deer Disposal									
	1. Meat Disposal	20								
	2. Sale and Donation of Hides and Skulls	20								
	C. Proceeds of Sales	20								

	ELD INVESTIGATION OR APPLIED RESEARCH
A .	Bison Age-Weight and Longevity
В.	Buffalo Measurements
C.	Buffalo Pregnancy and Lactation
D.	Range Condition and Trend
E.	Waterfowl Banding
F.	Behavior of Cow and Calf Bison
G.	A Study of the Abundance and Distribution of Rodents in
	Relation to Grassland Vegetation Type on the Bison Range
H.	Refuge Herbarium
I.	Behavioral Aspects of the Rut in American Bison
J.	Comparative Aspects of Social Organization of American
	Bison
К.	A Study of the Social Behavior of the Pronghorn Antelope
L.	Archaelogical Survey of the Bison Range
PUI	BLIC RELATIONS
A.	Recreational Uses
В.	Refuge Visitors
C.	Refuge Participation
D.	Hunting
E.	Fishing
F.	Violations
G.	SAFETY
	HER ITEMS
A .	
В.	Credits
C.	Photographs
RE	SEARCH REPORTS
A.	
В.	Archaelogical Survey of the Bison Range
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NATIONAL BISON RANGE

Refuge Narrative Report

January 1 to December 31, 1969

I. GENERAL

A. Weather Conditions

The year started with a record breaking 36 inches of snow in January. This topped previous snowfall records, for the month, by 10 inches. Temperatures remained unseasonably cold until mid-March. Natives complained it was the longest, coldest winter they could remember.

The following data are from the Refuge weather station.

	Precipitation						
	Snowfall	This Month	Normal	Max Temp.	Min Temp.		
January	36"	2.52	•95	48	-22		
February	2.5"	.16	.66	43	1		
March	311	•30	.69	64	-14		
April		•51	1.08	76	24		
May		1.22	1.78	87	23		
June		5-34	1.99	93	14		
July		.07	1.00	95	36		
August		•00	.87	102	34		
September		.68	.98	91	25		
October		•98	1.06	80	12		
November		.11	.80	58	12		
December	711	-38	88	48	9		
				Extre	nes:		
TOTAL	48.5"	12.27	12.74	102	-22		

During a thunderstorm on June 6, 1,80 inches of rain fell in about 20 minutes. Needless to say, water was everywhere, including the basement of all houses. This was caused by window wells filling and funneling the water through the cracks of the sill.

B. Habitat Conditions

1. Water

Water management is based on a 4 C.F.S. appropriation from Mission Creek. From this source, 40 acres of exhibition pasture, hay meadow, picnic and headquarters lawns are irrigated.

The Refuge gravity flow fire system (a 27,000 gallon reservoir) is maintained by pumping from this source. Creek flow is normally stable since it serves as a return for irrigation water used from Ninepipe and Kickinghorse reservoirs. Irrigation needs fluctuate with weather conditions.

Ground water could be described as excellent this year. Springs continued to flow throughout the summer. During late April and August it started getting dry but rains soon supplemented the storage and soil moisture.

2. Food and Cover

Range condition continued to improve as a result of good moisture, the rotational grazing system (see Sec. II, C) and reduced animal populations. Food and cover were abundant for all game species.

It appeared to be an excellent year for grasses. Rough fescue attained maximum plant growth and produced a good seed crop. Other major grasses, Idaho fescue and Bluebunch wheatgrass, responded similarly but were not as striking in comparison.

Noticeable improvement was observed in quanity, leader growth and vigor of most browse species. Berry producing browse plants (Chokesherry, serviceberry and snowberry) failed to yield a crop because of a late freeze on June 1 (14°).

Juniper and aspen, desireable food plants for big game animals, showed the least improvement. Stands of both are growing old and dying, especially along the creek bottom. Apparently they cannot re-establish without fencing for protection as game populations have been reduced and held at a minimum for four years. Some small plots have been fenced near the headquarters area with outstanding results of natural re-establishment. More plots are needed to aid in evaluating the importance of these two species.

Ponderosa pine and Douglas fir are increasing rapidly in the forest type. With the present rate of increase, they will soon become a problem for moving buffalo and harvesting surplus deer and elk. A series of photos taken in 1931, 1952 and scheduled for 1971 show considerable change throughout the 40 year period.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

A single Whistling swan was observed on Mission Creek in mid-January and another on Ravalli Ponds in early April.

The mid-winter waterfowl survey, conducted January 10, revealed 30 Canada geese, 800 Mallards, five American widgeon, 40 Goldeneyes and 60 Common mergansers on Mission Creek and the Jocko River.

Canada geese on Mission Creek produced a minimum of five broods totaling 34 young. Approximately 60 birds used the creek and display pool near headquarters until the opening of waterfowl hunting season in early October, when numbers increased to about 200.

Duck broods were first recorded June 20 with Wood ducks noted on the Jocko River, Blué-winged teal at Ravalli Ponds, and Mallards seen in the Elk display pasture. Subsequently, broods of Pintails and Redheads were observed at Ravalli Ponds.

Mallards, Widgeon and Pintails totaling two to three thousand birds spent much of the fall on the Range, particularly on Mission Creek. At the year's end, the population stood at 22 Canada geese, 910 Mallards, four Green-winged teal, 75 Golden-eyes and 30 Common mergansers.

2. Other Water Birds

A single Pied-billed grebe was observed on Ravalli Ponds in July and small numbers of Great blue herons were noted throughout the year along Mission Creek, the Jocko River and at the ponds.

Student Trainee Hedges, who was quite an avid birder, recorded a Virginia rail and a Sora in the Elk pasture. The former is a rare visitor to the Bison Range.

3. Shorebirds

Killdeer were common in several parts of the Range and young were first noted in the Elk Lane on June 6. Common snipe were heard winnowing in the headquarters area all spring and summer. Young snipe were first observed June 6. Wilson's and Northern phalaropes used Ravalli Ponds in small numbers, but no production was recorded. Spotted sandpipers were present in about normal small numbers.

4. Mourning Doves

Doves were first seen along Trisky Creek on April 21 and were common over most of the Range by May. Young birds were observed occasionally near headquarters and the slaughterhouse. Total numbers using the refuge is estimated to be less than 200.

B. Upland Game Birds

Upland birds fared well this year, particularly in view of the extremely hard winter of 1968-69.

Strutting male Richardson grouse were noted in at least three locations, including two previously delineated territories, Male activity continued well into September. At least five broods, averaging 5.0 young, were observed.

Ruffed grouse inhabit the Mission Creek and Jocko River bottoms, but are rarely observed. Student Trainee Hedges reported two birds in the lower portion of Trisky Creek, and several birds were observed just east of the Range boundary on Mission Creek this fall. No broods were seen.

The Columbian Sharptailed grouse, not seen on the Bison Range since the early 1950's, was reintroduced in April, 1969. Range personnel, in cooperation with the states of Montana and Idaho, trapped several birds on their dancing grounds near St. Anthony, Idaho. Unfortunately, females were hard to come by, with only one or two visiting a ground at any time. As a result, the final catch of 15 birds included only three females. These birds were released in a brushy area south of the Slaughterhouse.

To insure a successful transplant we should have had three times as many birds as were released. The status of the species is still pretty much unknown on the Range as only three observations, of single birds, were made subsequent to the release.

The reintroduction of this species is considered very desirable, and efforts will be continued in the future.

Ring-necked pheasant broods were observed in lower Elk Creek and along Mission Creek, averaging 8.3 young. Several hundred birds took refuge in the Mission Creek bottoms with the opening of hunting season on October 25.

Chukar partridge suffered severe losses during the past winter, but a few birds managed to survive and produce broods. At least six broods, averaging 8.7 young, were observed, with four in Trisky Creek, and one each in Elk Creek and Twin Canyons.

Gray partridge survived the rough winter in excellent numbers and produced numerous broods. This bird appears to be very well adapted to our area and coveys are seen from Highpoint to the creek bottoms in every conceivable habitat type.

A new species was added to our list this year when, on two occasions, a wild turkey was observed roosting along Mission Creek near the refuge entrance.

C. Big-game Animals

1. Buffalo

The bison rotational grazing program was altered in two instances during the year. Herd number one was to have used the Northside Range during the January to March period, but we were

unable to contain them there at that time. The herd was moved into the proper range in early January, but deep snows made grazing difficult and the animals jumped cattleguards and barriers and headed for the windswept ridge-tops. They were moved back twice but continued to resist plans for them. After considering the unusually adverse weather conditions and the relatively poor shape of the Northside Range, the rotation was altered to use the Lower West Range during the winter period. This provided further rest for the Northside Range and gave the herd the ridge-tops they were so persistent in seeking.

Further problems with the rotational system were encountered during the summer period (July - September), when both herds were scheduled for ranges on the South side of the refuge, far from the public's view. Due to the design of the grazing system, this will occur once every four years. After surveying the general condition of all range units with S.C.S. personnel, it was decided there would be no harm to the range if the rotation was altered to place one herd in a unit more readily accessible to the public. Herd number one was then moved to the Alexander Basin Range instead of the Upper South.

As mentioned above, S.C.S. personnel returned this year for the first re-survey of the range since 1964, when the present deferred rotation grazing program was put into effect. All were well pleased with the obvious improvement in the condition of the range. Most strking was the 42% reduction in acreage in Fair condition with corresponding increases in Good and Excellent range. In the short time since the system has been in operation there has been a gain of approximately 1000 a.u.m.'s which equals enough forage to graze an additional 99 bison (average .87 a.u. per bison). (See table below).

Change in range condition 1964-1969 in acres per condition class.

Range condition	1964		1969		Percent	
Class *	Acres	%	Acres	%	Change	
Excellent	570	3%	1,759	10%	+ 7%	
Good	7,320	42%	13,853	78%	+ 36%	
Fair	9,500	54%	2,013	12%	- 42%	
Poor	235	1%	trace		- 1%	

^{*} Range condition class: based on S.C.S. method using percent of climax vegetation present.

The outstanding success of the deferred rotation grazing system has been obvious, not only to Range personnel and other professionals but to the visiting public as well. The near-naturalness of Bison Range grasslands is important to the visiting public and is a good selling point for the Bureau.

Minor distribution problems are still apparent in some range units, but effective use of salt and continuing water development

keep over-use to a minimum.

The first bison calves were noted April 8 in the Alexander Basin Range, 10 days earlier than last year. By the end of the month there were 30 of the rusty-colored young ones running with the herds. During round-up, 96 calves were tallied. Known losses were six, bringing the total calf crop to 102 from 107 cows of breeding age (95% crop). This was a welcome increase from the 85% calf crops of the past three years and relieves the fear that some undetected disease was at work in the herds. (See following table).

Annual Calf Production 1955 - 1969 15 year average - 89.2%

1955 - 90%	1960 - 80%	1965 - 94%
1956 - 92%	1961 - 94%	1966 - 85%
1957 - 84%	1962 - 84%	1967 - 85%
1958 - 95%	1963 - 91%	1968 - 85%
1959 - 90%	1964 - 94%	1969 - 95%

The calf sex ratio was again unbalanced in favor of females (55 F: 47 M), although not nearly so much as it was last year. Apparently sex ratios in calves fluctuate in either direction periodically, but the long term average is very nearly even. The 1960 - 1969 average shows 100 F: 97.7 M.

A total of 416 animals was tallied during the annual roundup, held October 1 through 8. An estimated 16 bulls, later accounted for, were missed and left on the range during the activities. The two range herds were worked through the corrals separately and the bulls rotated from one herd to the other.

U.S.D.A. officials John Corcoran, D.V.M., St. Ignatius and Bob Manlove, Livestock Inspector, Missoula, were on hand for the brucellosis vaccination and ear-tattooing. The 52 heifer calves were vaccinated and all calves branded with a "9" on the lower left hip and tattooed with a "V-9" inside the left ear. The 79 live sale animals were ear tagged and back tagged for ease of sorting and handling.

Range herd #1, totaling 194 animals, was released in the Upper South Range and herd #2, with 126 head, was turned into the Upper West Range. The 16 "escapees" will be incorporated into the smaller herd when the opportunity presents itself.

Ninety-six breeding age cows were returned to the range. The herd sex ratio was 100:93.7, female to male.

The butchering program was eliminated entirely this year except for five animals which had to be disposed of for humane reasons. One bull and one cow with bad hips were butchered at round-up and three calves with various injuries were salvaged. Meat from all five animals was donated to local schools for the hot-lunch program. Seven other animals were lost during the year to disease and accidents. (See Disease, Sec. II, I, 1.)

Bison Herd Composition December 31, 1969

AGE	MALE	FEMALE	TOTAL	ANIMAL UNITS
Calf	43	53	96	28.8
Yrlg.	27	26	53	34.5
2	15	14	29	26.2
3	13	10	23	25.9
4	14	17	31	34.9
5	15	11	26	33.9
6	7	11	18	22.9.
7	5	11	16	19.5
8	5	4	9	12.5
9	5	6	11	15.0
10	-	4	4	4.0
11	-	3	3	3.0
12	-	1	1	1.0
14	-	3	3	3.0
17	_	1	1	1.0
Unknomisse	d at		- /	
round	up 16		16	27.2
TOTAL	165	175	340	293•3

2. Elk

The elk herd numbered 53 head at the start of the year, increasing to 68 with the addition of the calves. No losses were known to occur and the herd was held stable at 53 with the removal of 15 animals during the annual disposal. (See table following.)

Elk Herd Composition & Disposal Summary - 1969

Sex & Age	Pre-disposal	Disposal	Balance
Adult Male	18	3	15
Yearling Male	4	2	2
Adult Female	27	7	20
Yearling Female	4	3	1
Calves	15	0	15
Totals	68	15	53

The adult cow to calf ratio was 100:55.6 and the total cow to calf ratio was 100:48.4. At the end of the year the adult portion of the population consisted of 55% females and 45% males or 100:81

Eight adult bulls spent most of the summer along Mission Creek and provided many late afternoon thrills to the visiting public. The elk, next to the bison, is probably the most sought after and asked about species on the Range.

The exhibition herd remained static at two bulls and three cows. While working with members of the Montana Cooperative Wildlife Research Unit on the N.A.S.A. radio-telemetry project, the remains of twin calves, which were apparently aborted or born dead in 1968, were discovered. The oldest cow has a history of twin births. Two of the cows were of breeding age this year, but apparently neither bred successfully.

3. Mule Deer

The population at the beginning of the year was estimated at 217 animals. Known losses totaled nine, including four that were apparently taken by feral dogs, one from tick paralysis (see photo section) and four from unknown causes. Herd composition and disposal data are summarized in the following table:

Mule Deer Herd Composition & Disposal Summary - 1969

	Sex & Age	Pre-disposal	Disposal	Balance	
	Adult bucks	85	31	54	
	Yearling bucks	26	9	17	
	Adult does	80	29	51	
	Yearling does	26	10	16	
	Fawns	89	1	88	
TO	TAL:	306	80	226	

The adult doe: fawn ratio was 100:111, with a total doe: fawn ratio of 100:84. The adult portion of the post-disposal population consisted of 49% females and 51% males or 100:106 female to male. The end of the year population was estimated at 217.

4. White-tailed Deer

Snow conditions were perfect for the annual census and the refuge crew snow-shoed the Mission Creek bottoms for one of the best white-tailed deer counts in history. Some animals were undoubtedly missed in the timber below Highpoint. That area was not covered the day of the annual census due to a shortage of University people participating in the count. However, better information was obtained than for the past several years.

The population at the beginning of the year was an estimated 158 animals. Composition counts showed 84 fawns. Known losses totaled ll animals, most of which were probably winter-kill. Three orphaned fawns and a yearling buck were received from outside sources this year. The usual thing is someone picks up a "poor little orphan" and takes it home only to find they are unable to care for it and can't just turn it loose again. Of course these "pets" are one of the big attractions for the visiting public.

Herd composition and disposal data are presented in the table below.

White-tailed Deer Herd Composition & Disposal Summary - 1969

Sex & Age	Pre-Disposal	Disposal	Balance	
Adult bucks	52	15	37	
Yearling bucks	31	10	21	
Adult does	46	10	36	
Yearling does	30	5	25	
Fawns	87	_6	81	
TOTALS:	246	46	200	

The adult doe:fawn ratio was 100:189 and the total doe:fawn ratio was 100:114. This high adult doe:fawn ratio may reflect an error in classification of yearling and adult does. It is extremely difficult to separate them under field conditions. Adults consisted of 48% does and 52% bucks or 100:109 female to male.

5. Bighorn Sheep

The status of the sheep population remains uncertain again this year. At the end of 1968 the population, on paper, should have numbered 53, but the best counts that year indicated only 33 known animals. This figure appears close to the actual number present. The highest count this year totaled 39 head, including 10 lambs. Until better information is obtained, it is assumed there were 33 sheep at the beginning of the year, plus 10 lambs, and one known loss, leaving 42 at year's end. The single loss was a $4\frac{1}{2}$ year old ewe which had a malignant melanoma on the lower jaw. (See Disease Section.)

6. Antelope

The Pronghorn herd numbered 87 animals at the beginning of the year, and the fawn crop totaled 41. Known losses were 14 including three collected for research, three killed by dogs or coyotes, two with foot-rot and saven from accidents and other natural causes. The population stood at 114 at the end of the year.

Composition counts showed 42 bucks, 45 does and 41 fawns prior

to losses. The doe: fawn ratio was 100:91 and the adult doe: adult buck ratio was 100-93.

7. Rocky Mountain Goat

The goat population continued to increase, with the addition of two kids, to ll animals. They are not often seen, but occasionally come into view on Headquarters Ridge or near Highpoint.

8. Longhorn Steers

Tom and Jerry, the 19 year old steers, both succumbed to the severe winter weather this year, reducing the "herd" to two animals.

9. Black Bear

Two bears were observed during the spring and summer months. On the annual Saddle Club Ride, bears were sighted on Headquarters Ridge and in the head of Elk Creek near Highpoint. One animal was noted near Highpoint on several occasions and residents along the Jocko River reported a bear in Spring Canyon for several weeks.

D. Fur Animals, Predators, Rodents and other Mammals

The number of coyote observations continues to increase and they are now commonly seen over most of the Range.

One Bobcat was seen near Tower 2 during the annual big-game count and tracks were noted in Trisky Creek late in February.

Badgers were common as were Long-tailed weasels. One mink was sighted near the ponds in lower Elk Creek. Few skunks were observed on the Range, but there were numerous road kills in the general area.

Porcupines were abundant, as usual, and some damage to trees was noted. None were removed this year.

Columbian ground squirrels were first seen March 21 in the Exhibition Pasture. The Yellow-bellied marmot colony inhabiting the wood pile on the north side of Mission Creek homed numerous marmots.

Mountain vole populations were exceptionally high all over the Range this year, reflecting the excellent cover conditions produced by the deferred-rotation grazing program.

Mountain cottontails were common and several Snowshoe hares were observed in the timbered area north of Highpoint.

The past policy of no predator control was continued.

E. Hawks, Eagles, Owls, Ravens, Magpies

Hawk observations remained similar to past years with the exception of a Pigeon hawk observation in Trisky Creek in early September. Sparrow hawks were quite common and many young were seen near Headquarters and the bison corrals. Prairie falcons were noted throughout the year, as were Marsh hawks. Red-tails were first seen April 8. A Cooper's hawk was noted at Headquarters in February and Rough-legged hawks were present during the winter months.

Golden eagles were seen year-long with a peak of five or six birds. The nest site on the north slope of Highpoint was again inactive. An adult was observed on the nest on one occasion but never seen on or near it again. A single Bald eagle was noted along Mission Creek in early February.

Great horned owls were seen along Mission Creek and the Jocko River. Short-eared owls were common year-round residents. A long-eared owl was found dead on the road just east of the refuge entrance on February 3. Another one was seen at Headquarters the following day.

Ravens and crows were observed on occasion in small groups and Magpies were common year-round residents.

F. Other Birds

The Student trainee recorded observations of 110 of the 185 species on the refuge bird list. Noteable were new seasonal occurrence records for the Bufflehead, Solitary Vireo, Bobolink and Lazuli Bunting and a nesting record for the Redhead. The Wild turkey was also added to the list with two sighting along Mission Creek. This species was released near Plains, some 40 miles from the Bison Range, several years ago. They have frequently been observed in the Dixon area for the past three or four years.

The nesting Starling population declined again this year, possibly due to a heavier concentration of nesting Brewers' blackbirds which jealously defended their territories from all intruders, avian and human as well.

Bobolinks were seen on the Range for the first time in several years.

G. Fish

In September, a Montana Fish and Game crew electro-sampled a 450 feet section of Mission Creek in conjunction with other sampling being done in the Flathead Valley. They netted 43 fish, including three Rainbow trout, 25 Whitefish, three Squawfish and 12 Columbian horsetail suckers. They were impressed with the relative fertility and food supply of the creek, but bemoaned, as have we, the silted condition of the stream.

H. Reptiles

Western rattlesnakes were encountered on several occasions through the late spring and summer, in most cases along the refuge roads. Three rattlers were found at Highpoint when the 210 Saddle Club riders stopped for lunch. Needless to say, there was much scurrying and hurrying for safer ground. One Rocky Mountain rubber boa was observed on the tour road at Highpoint.

I. Diseases

1. Buffalo

On April 10, while making a range inspection, several yearling bison were found in a paralized condition in Alexander Basin. The animals were heavily infested with engorged ticks, particularly in the neck region and at the base of the skull. An intensive search over the next several days produced two dead and seven living, but paralized yearlings. The animals were brought into the barn at Headquarters where ticks were removed, the neck hair clipped and insecticide applied. Dr. Keyser, local Veterinarian, treated all animals with antibiotics and saline solution. Most were on their feet from 12 - 36 hours after treatment and all recovered. This was the first reoccurance of tick paralysis since 1951.

A few days later a two year old cow, bleeding at the nose and eyes, was brought into the corrals at the slaughterhouse. The animal died the following day and was "posted" by Dr. Keyser, the local veterinarian. He found heavy sub-cutaneous, pelvic and organic hemorrhage and suspected Clostridium. Tissue analysis showed "abundant Clostridium multifermentans (not pathogenic by itself) and Cofeseri (cause of blackleg)". No cause of death was determined. However, the herd is being closely watched for further symtoms of blackleg. Dr. Corcoran, U.S.D.A. Veterinarian, feels there is insufficient evidence to justify vaccinating for this disease.

A yearling heifer with an abcess on the hip was brought to the corrals and successfully treated. Another sick yearling heifer with swollen joints was treated several times with antibiotics and held in the corrals for over a month for observation. Little response was noted. She finally escaped and joined the herd, apparently recovered as no sick or weak yearlings were noted at roundup.

The heifer calf born in the exhibition pasture was successfully treated for a navel hernia.

All buffalo calves were vaccinated for <u>Pasturella multocida</u> this year for the first time. Vaccine was prepared by Dr. Kenneth Heddleston of the U.S.D.A.'s National Animal Disease Laboratory, Ames, Iowa.

2. Elk and Deer

Two Whitetail deer were found with tick paralysis during the

outbreak involving buffalo. One was found dead and the other was alive and brought in for treatment. It had been badly mutilated by magpies and did not recover.

Blood serum samples were submitted for testing from all elk and deer collected during the fall disposal program. All samples tested negative for Brucellosis and Leptospirosis. Anaplasmosis tests whowed three anticomplementary reactions in deer and one suspected reactor in elk. All others were negative.

3. Bighorn Sheep

A ewe with a large lump on the lower jaw was noted on several occasions this summer. She was in poor condition, but still able to feed; however, by September it was obvious the animal would not survive. Montana Cooperative Wildlife Research Unit personnel assisted in immobilizing the animal for closer inspection and, due to it's poor condition, the animal was purposely over-drugged and killed. The body weight was approximately 80 pounds and all the lower inscisors were gone. The carcass was taken to the Veterinary Research Laboratory in Bozeman for necropsy and disease analysis. Their diagnosis was Malignant melanoma. We have been assured that the condition is not contagious to the other members of the herd.

4. Antelope

Two animals in the exhibition pasture developed foot-rot this summer. The buck was immobilized and treated but had an advanced case and died the following day. Another buck and a doe were trapped in the bison corrals and released in the exhibition pasture. Two weeks later the doe broke her neck in a fence corner, and was found to have an advanced case of foot-rot.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Refuge Work Programs

a. Fence Construction and Repair

A fence, 220 rods in length, was rebuilt on the east side of Elk Lane, extending from Sixgates to the bison corrals. Wooden posts were replaced with steel and the gates rebuilt. Existing wire was salvaged and re-used. Thirty-three rods of division fence within the holding pens was reconstructed.

The three-quarter mile of barbed wire fence, running from the contour fence above Agency Springs to the west boundary fence, was covered with 47", #9 woven wire. This portion of fence receives extreme pressure when bison are in pastures on both sides of the fence. The woven wire should eliminate the frequent maintenance necessary to keep it effective.

The 12' x 8' cattle guards, installed to facilitate the self-guiding tour, have proven ineffective in preventing bison movement. One guard, located in Alexander Basin, was extended by installing a 12' x 6' guard in conjunction with the existing one. It was necessary to construct end wings for this over-sized structure.

The lower Mission Creek flood gate was renovated by replacing the old wooden stringer with a 21 inch steel I-beam obtained from surplus sources. The existing gates were salvaged and re-used for this structure.

The pipe corrals, constructed in 1968, were sand blasted to remove the rust scale. After cleaning, they were coated with a rust preventative paint. Prior to roundup, corrals were checked and repairs made as needed.

A 107 rod section of contour fence located west of the bison corrals was relocated. This was accomplished to provide water in the northeast portion of the lower west pasture. Better grazing distribution is anticipated in this pasture.

A 20 rod section of fence was constructed to eliminate congestion and over-use in the corner of the division fence between the Alexander Basin and lower South ranges.

The entire 23 mile boundary fence and all interior fences were checked and repairs made as required. This was accomplished during periodic patrols.

b. Roads and Bridges

All refuge patrol roads and the self-guiding tour route were bladed to remove oversized rock and annual weed growth. The rock rake was used on the tour road to move gravel back onto the traveled surface. The perimeter road was again bladed in late summer to remove vegetation and form a more effective fire break.

A washout occurred in the north boundary road during spring run-off. A total of 56 cubic yards of fill was hauled to repair the damages.

The Bureau rock crusher was moved from Tule Lake Refuge to the Bison Range in April, following an agreement with Kickinghorse Job Corp. They were to assemble and operate the machine as one of their training projects. The gravel was to be spread on our tour route as part of the program. By mid-fall the machine was set up and ready to run. Job Corp, or the Northwest Indian Manpower Skill Center (after July 1), personnel soon found more pressing business elsewhere. The Bison Range inherited the machine operation and two men were assigned the task, when other duties permitted. At the end of the year, approximately 2000 cubic yards had been crushed, at a cost of \$1.52 per yard. We found time to haul and spread 600 yards in the lower Pauline area. This was applied three inches deep on the 12 foot surface.

A permanent pipe barrier was constructed at the junction of the road leading to the Highpoint lookout tower.

Piers on the bridge east of the elk pasture were seriously undercut during spring run-off and 48 cubic yards of large rock rip rap was placed there to alleviate this condition.

c. Building Maintenance

Quarters No. 62: The interior was completely painted, prior to the arrival of the new manager. Sagging floors were leveled and braced.

Quarters Nos. 63 and 64: The interior of these residences were painted. New linoleum was installed in the kitchens and the roofs of both houses were completely rehabilitated by removing the old wooden shingles, wheathing with 2" plyboard and installing stick-down type asphalt shingles.

Building No. 4: The office roof received the same treatment as Quarters 63 and 64. The three front rooms were painted and shelves constructed for book storage.

Building No. 7: This building, built in 1919 and used for various purposes, including a blacksmith shop, coal storage and warehouse, was razed and removed from property. It was in an extreme state of disrepair and not feasible to maintain.

Building No. 73: The old asphalt shingles were removed and replaced with 230-pound stick tab asphalt shingles.

Building No. 9: The wooden shingled roof, constructed in 1924, was stripped and covered with galvanized metal roofing.

Quarters Nos. 2 and 3: These buildings were declared surplus to the refuge needs and were sold under informal bid to K. C. Dunn-webber of Charlo for \$76.00 and \$154.00, respectfully. They were removed from the refuge during the month of August.

Building No. 18: This building was the garage for Quarters No. 2 and was also declared surplus and sold. It was purchased by Grant McPherson of Dixon for \$301.10. The building was removed in the month of September.

d. Automotive Equipment Maintenance

Major repair and maintenance work accomplished included: fabrication of anti-roll bars for the Ford backhoe, I-49822, the Ford Ferguson, I-49886 and the Farmall, I-49429; repainting the horse trailer; building a SAFETY shield for drive belts on the rock crusher; cleaning, sanding and painting the Hobart welder; and replacing rear differential gears and bearings and relining brakes on the Ford 4 x 4, I-75650. Also included was the repair of the starting

system on the TD 18A, I-89242; helping to assemble, adjust, and operate the rock crusher in cooperation with the Manpower Skill Center; and performing necessary repairs and adjustments for 5000 mile preventative maintenance checks.

e. Miscellaneous

The old foundations of Quarters 2 and 3 were removed and the basements filled with approximately 300 cubic yards of fill.

Two pit-type latrines were installed near the bison corrals, for public use. These structures sere obtained as surplus from the Job Corp, prior to July 1.

A total of 1630 bushels of barley was hauled from Kootenai Refuge and stored for winter feeding and banding operations at the Bison Range and Ninepipe.

Hay meadows and exhibition pastures were igrigated and fertilized as required. A total of 49 tons of hay was harvested and stored in the horse barn for winter use.

All signs used on the self-guiding tour route were refinished with a penta base redwood stain. Several new signs were constructed and placed where needed.

Five stand pipe type water supplies, located in the picnic area, were replaced with a rustic post type, as pictured in the photo section.

Cleanup, mowing and maintenance of the Headquarters grounds and picnic area required a considerable number of man hours, especially during the tourist season.

A spring was developed, west of the bison corrals, by constructing a concrete collecting box and piping collected water a distance of 450° to a previously constructed cement trough. This project more than doubled the flow into the trough and should provide ample water in this area of the lower west pasture.

A 42° x 30° picnic shelter was constructed by Job Corp. This was the last cooperative project completed by that agency.

B. Plantings

1. Trees and Shrubs

None.

2. Upland Herbaceous Plants

Approximately four acres of bare and eroded areas within the exhibition pastures were seeded with Western wheat grass - Alta fescue mix. It was first mulched with barnyard manure and waste hay.

C. Collections and Receipts

1. Seed and other propagules

Two hundred pounds of Timothy seed were received from Kootenai Refuge in September.

2. Specimens

The following specimens were collected during the year:

Whistling Swan	7	Frozen
Sparrow Hawk	2	11
Gray Partridge	ĩ	11
Killdeer	1	21
Long-eared Owl	1	Museum mount
Pileated woodpecker	1	Frozen
Lewis' Woodpecker	1	11
Dipper	1	31

All specimens were found dead and frozen for future mounting and display in the proposed visitor center.

D. Control of Vegetation

1. Biological Control

The goatweed beetle, <u>Chrysolina quadrigemina</u>, population remained at a very low level. Control of goatweed by beetles during this period was insignificant and the plant continued to spread in areas that were free of chemical control.

2. Chemical Control

Canada thistle control was continued, using ground spray equipment, with efforts concerntrated on infestations along roadsides, canal banks and etc. Initial results appeared good, with an apparent kill of 90 - 95%.

Aerial spraying to control goatweed was continued. A helicopter was contracted to apply spray to areas in the upper and lower west pastures. The terrain in these areas makes it impractical to use ground equipment or fixed wing aircraft. The chemical was mixed at one gallon of 2,4-D amine to three gallons of water and applied at the rate of two pounds acid equivalent per acre. A total of 882 acres was treated and the initial results appeared to range from 75% to 90% kill.

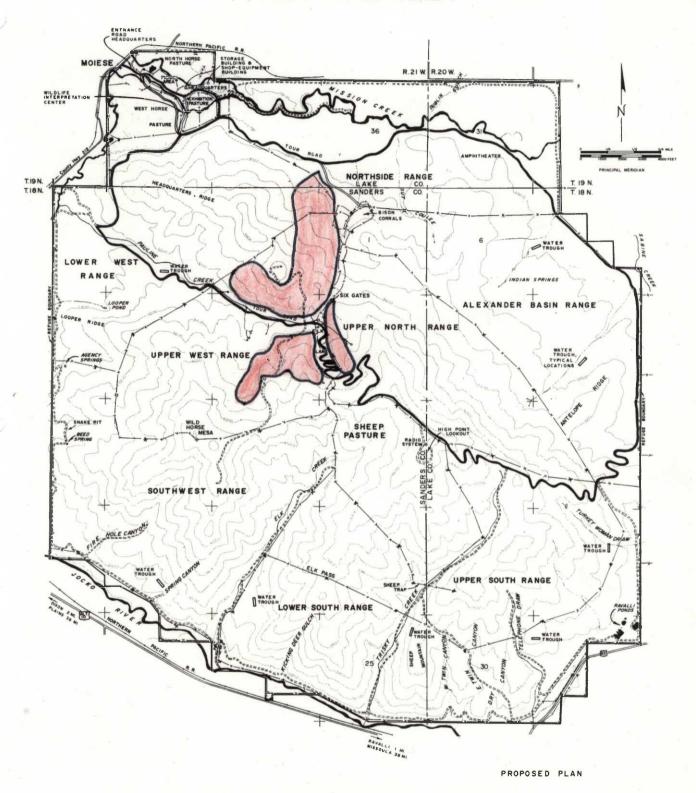
E. Planned Burning

None.

F. Fires

None.

1969 AERIAL GOATWEED SPRAYING



MONTANA NATIONAL BISON RANGE
Moise, Montana

IV. RESOURCE MANAGEMENT

A. Surplus Buffalo Disposal

1. Live disposal and meat sales

Seventy-nine animals were sold alive, on the basis of a sealed, competitive bid sale, as in 1968. A total of 25 bids was received, with the bid awards to eleven buyers totaling \$29,109.84, or an average of \$368.48 per animal, as summarized below:

Number	Age Group	Total Bids	Ave/Animal
36	Yearlings	\$13,525.82	\$375.71
6	Two-year olds	2,547.22	424.54
1	Three-year olds	479.00	479.00
3	Six-year olds	1,289.40	429.80
14	Eight + cows	5,268.40	376.31
19	5 - 10 yr. bulls	6,000.00	315.79
TOTAL 79		29,109.84	368.48

Buyers names and the number of animals they purchased follows:

Jim Burnett Luther, Montana	5	W. O. Oleson Moscow, Idaho	1	B. L. Tiffany LaFayette, New York	22
Bob Fieber Siletz, Oregon	1	R. J. Gress Ennis, Montana	6	Tom Collins Missoula, Montana	1
Diane Rubino San Jose, Calif.	1	Harold Wright Heppner, Oregon	1	Don Hight Murdo, South Dakota	19
Durham Meat Co. Gillette, Wyo. & San Jose, Calif.	16	Don Hanscom Gold Rey Ranch Central Point, Or	re. 6		

The live sale was again successful and the butchering program, except those animals taken for humane reasons, was discontinued. Meat from collected animals was donated to local schools for use in their hot-lunch programs. Most of the meat is distributed to the schools through BIA, Ronan.

2. Sale and Donation of Hides and Skulls

Seven hides and six skulls from the 1968 disposal program were sold. A buffalo cow hide sold for \$78.85 and a bull skull for \$121.15. One buffalo calf skull was donated to the Dept. of Zoology, University of Montana, Missoula.

B. Surplus Elk and Deer Disposal

1. Meat disposal

Twelve elk and 126 deer taken during the fall disposal were distributed to Montana schools for use in the hot lunch program. One elk was again sold to the Lake County 4-H Council Junior Fair, in accordance with prior authorization. A handling charge of 15¢ per pound of dressed meat was charged to help defray collection costs. Estimated comparative annual costs for this program are summarized below:

	DEER				ELK			
	1966	1967	1968	1969	1966	1967	1968	1969
Cost/Animal	12.86	11.77	17.27	25.60	35.14	20.53	32.86	52.64
Rev./Animal*	5.94	8.48	17.19	16.70	27.65	34.12	41.77	49.01
Difference:	-6.92	-3.29	08	-8.90	-7.49	13.59	8.91	-3.63
MT 7 1	Lane 27 2		7				1.2.3.	7

*Includes handling charge plus average receipts from hide sales.

As shown in the table, cost of collection, per animal, was extremely high this year. The primary reason is contributed to the nice weather requiring extra hunting time to fulfill quotas. Normally the 15¢ handling fee should cover costs. An increase in the fee will be assessed if the program continues to operate in the red.

2. Sale and Donation of Elk. Deer and Antelope Hides and Skulls

A total of 17 elk hides, 98 deer hides and 27 deer antlers from the 1968 program were sold.

Donations included one cow elk skull and one male antelope skull to Western High School, Anahiem, California; a white-tail doe and a whitetail buck skull to Ogden High School, Ogden, Utah; an antelope buck skull to Eastern Michigan University, Ypsilanti, Michigan; and an antelope buck skull and a badger skull to Brookings Harbor High School, Brookings, Oregon.

C. Proceeds of Sales

Total receipts from sales for the period January 1 through December 31, 1969 were as follows:

Live buffalo	\$29,109.84
Deer and Elk Meat	2,349.75
Buffalo hides	262.85
Elk hides	80.46
Deer hides	230.93
Skulls and antlers	335.83
Employee's horse grazing fees	48,00
Marsh concession	656.03

Golden Eagle Passports 1,400.00
Daily entrance permits 3,424.00
Sale of surplus, used property 565.78

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Bison Age-Weight and Longevity - Refuge Personnel

The following table is primarily for the records. Our objective is simply to determine the age animals start decreasing in weight or what age they reach and maintain their peak weights, plus the longevity of each sex. It appears premature to attempt drawing conclusions from the present data.

SEX	YEAR OF BIRTH	DATE MARKED	WEIGHT 10/66	WEIGHT 10/67	WEIGHT 10/68	WEIGHT
M	1960	7/17/63	1605	1710	Broke 18	
M	1959	7/17/63	1670	_	1610	
M	1956	7/17/63	1785	1875		
M	1963	7/09/64	1175	1435	1640	1660
M	1963	7/09/64	1150	1335	1485	1550
M	1961	7/09/64	-	1780	1800	1865
M	1958	7/09/64		1685	1760	butchered //
M	1964	7/13/64	865	1050	1370	1410
M	1959	10/11/65	1775	1825	butchered bad eye	
M	1963	10/11/65	-	1335	1465	1680
M	1959	10/11/65	1640		1790	-
M	1965	10/11/65	730	1005	1430	1660
M	1959	10/11/65	Accident	ly butchere	d in 1966	
One	marked anima	al never fou	nd again.			
F	1963	7/09/64	No recor	d since mar	ked	
F	1956	7/09/64	910	-	-	
F	1959	7/09/64	1060	1015	1070	1030
F	1957	7/09/64	1080	1015	1095	1125
F	1954	8/13/64	No recor	d since mar	ked	
F	1964	8/13/64	800	830		
F	1955	10/11/65	900	-	980	1020
F	1955	10/11/65	1010	1035	1000	1060
F	1952	10/11/65	-	-	_	925
F	1965	10/11/65	610	820	875	925
F	1950	10/11/65	-	935	_	
F	1954	10/11/65	1090	1070	1045	-

B. Buffalo Measurements - Refuge personnel

None taken this year.

C. Buffalo Pregnancy and Lactation - Refuge personnel

This study was terminated when the butcher program was discontinued in favor of live sales.

D. Range Condition and Trend - Refuge personnel

One Parker 3-step transect cluster of five transects was added to the 20 previously established. Plans call for at least three clusters in each pasture or a total of 24. Transects located in the pasture receiving fall use will be read each year; this provides a four year cycle.

E. Waterfowl Banding - Refuge personnel

Post season banding at Bison Range Headquarters netted 435 Mallards and three Canada geese.

On June 30 and July 1, Bison Range personnel cooperated with U.S.G.M.A. Brann and Montana Fish and Game in drive trapping 185 Canada geese at Ninepipe Refuge and on Flathead Lake.

Pre-season Mallard banding was conducted at Pablo Refuge in conjunction with Montana F & G goose banding operations. A total of 945 Mallards and 300 Pintails was cannon-netted. Cost was slightly over \$.48 per bird. The State goose banding project was unsuccessful.

Forty-one returns were taken during post season operations. None had made previous returns. Numerous recovery reports were received during the year, although none were particularly significant. Recovery data, compiled through the years, has become so voluminous it is too cumbersome to analyze. Plans are to put it on a simple punch-card retrieval system in the near future.

F. Behavior of Cow and Calf Bison - Joseph Englehard

Thesis completion was scheduled for January 1969 but was not received by year's end.

G. A Study of the Abundance and Distribution of Rodents in Relation to Grassland Vegetation Type on the National Bison Range - Melvin Morris

The objectives of this study are (1) to determine species and density (number) per acre of mice and pocket gophers by major grassland types (five types); (2) to determine species and density per acre on paired excellent condition range and weedy types for each of the five major grassland types; and (3) to determine species and density of paired weedy types as is, with litter removed. No information is available for this report.

H. Refuge Herbarium - Dr. John Thomas

The over 400 plants collected by Dr. Thomas, Carol Bromley and Refuge personnel have been classified and filed in the herbarium. Dr. Thomas' report, "Vascular Flora of the Bison Range", has not been completed.

I. Behavioral Aspects of the Rut in American Bison - Dale F. Lott

The primary focus of this research has been agressive interactions in mature male American Bison. A preliminary description of this behavior occurs in the reports of McHugh (1958) and Fuller (1960). These descriptions have been considerably amplified during the last four summers' research. The major amplification has been in recording the occurrence of a broadside threat posture in addition to the head-on threat described earlier, plus the first report of a submission signal. This aspect of the research has been reported (all illustrated by movies) at several professional meetings and invited colloquies. The most recent (and most comprehensive) report was made at the meeting of the American Association for the Advancement of Science, on December 29, 1969. A manuscript on this topic is currently being prepared for submission to Animal Behaviour.

The secondary focus of the research has been sexual behavior. A complete description of copulation in this species has not been available in the scientific literature. The available description (McHugh, 1958) is based on a total of six instances. Since I have observed dozens of copulations I am in a position to amplify McHugh's description considerably and eventually will do so. But my research has been slanted more toward understanding the effect of sexual behavior on social relationships in the herd, than toward a bare description of the behavior itself. To date the most complete and successful work along this line consisted of following five naturally marked cows through the rut and recording, several times each day, whether or not they were accompanied by bulls. These records permit the description of the effect of estrus on the attractiveness of the cows. This study is so simple-minded as to seem hardly worth doing. nonetheless the results proved it very valuable. It refuted the general assumption that the attractiveness of the cows was entirely a function of their estrus condition. Some cows attracted little attntion from bulls even during the peak of heat, while others had large followings day after day despite a complete absence of indications of heat, and very low tolerance for breeding efforts by males. This is one of the few bits of evidence for evolution by sexual selection in female mammals and is a valuable addition to that area of knowledge.

NOTE: The above abstract was written by Dr. Lott.

J. Comparative Aspects of Social Organization of American Bison - David M. Shackleton

This M.S. thesis was published by the University of Western Ontario, London, Canada, in August 1968 but was not received in time

for inclusion in the 1968 narrative. Following is the abstract of this thesis. A copy is on file at refuge headquarters.

The social organization of bison was studied at Elk Island National Park, Alberta and at the National Bison Range, Montana. The two areas differ considerably in habitat and in bison management. Elk Island National Park is heavily wooded with scattered meadows, while the National Bison Range is open Palouse Prairie. The Elk Island animals have free range of the area, while the Bison Range animals are intensively managed in a deferred rotation grazing program. Bison were observed to form two group types, mixed and bull groups, for most of the year. At Elk Island, the mixed groups were small, commonly 5 to 20; these groups often forming larger groups on the meadows. Large mixed groups of 100 to 150 animals at the Bison Range were believed the result of management practices and the open habitat. Bull groups used a larger area than the mixed groups. In both study areas the bull groups ranged from lone and paired animals to 20 to 30 bulls, composed of three year and older animals. The beginning of the breeding season (August) marked the break-up of bull groups and the entrance of individuals into the mixed groups. Sub-adult bulls were observed in the mixed groups before the adult bulls. The presence of cows in estrus in mixed groups appeared to be a factor in the movement of bulls into these groups. During the breeding period a number of sub-groups of adult cows with calves less than ten weeks old were observed. Reactions of adult bulls to cows with young, compared to behavior toward other cows, suggested the cows with young calves were not in heat. It is possible that lactation delays the onset of oestrus.

K. A Study of the Social Behavior of the Pronghorn Antelope - David Kitchen

The purpose of the study is to describe and analyze the social behavior of the Pronghorn Antelope and it's relationship to other animals on the range. So far, 42 behavioral acts have been described, with more observations necessary to quantify preliminary data. Twenty-two of the 41 fawns born were eartagged for individual study. The white markings on the Pronghorn's head and neck were discovered to be highly variable. It is possible that individual animals can be identified by this method. Field observations indicate three types of breeding behavior in rutting bucks; territorial, harem and tending bond during the actual breeding season.

Pronghorn and buffalo use similar habitat but with considerable antagonism between species. When bison feed into an area used by Pronghorn, the antelope leave. Antelope are nervous around bison and are occasionally chased. Antelope and White-tailed deer demonstrated a high level of behavioral antagonism, with both reacting aggressively when approached by the opposite species. Bighorn sheep, Mule deer and Elk used different habitat types so little competition was noted. So far the study has indicated both habitat selection and antagonistic behavior play a role in the separation of some of the species. The full degree of ecological separation requires further study.

The preliminary report is included at the end of the report.

L. Archaelogical Survey of the National Bison Range - Cecil D. Barnier

During the summer. Cecil D. Barnier, a work-study employee from the University of Montana, conducted an archaelogical survey of the refuge. He located and recorded seven sites; three possible eagle catch pits, two campsites and two placer mine sites. A collection of artifacts, found approximately ten aerial miles northeast of the refuge, was donated to us. The points were all analyzed and some date back to 2000 to 7000 B.C. For further detail see the attachment at the end of the report.

VI. PUBLIC RELATIONS

Recreational Uses

1

This year's public use increased 13%, from 69,000 to 79,400 actual visits. June, July and August accounted for 59% of the total, or 47,000 visitors. The peak load day was July 26 with over 1200 tourists. January was again the record low month with only 200 visitors. Forty three percent (33,800) took the 19 mile self-guided auto tour. One day, 425 cars were recorded making the trip.

The self service \$1.00/car fee for the tour and the Golden Eagle passport were favorably accepted. Many people were disappointed to hear the passport was to be discontinued. A limited sample during two week days showed that 70% of the cars were from out of state.

With public use of this magnitude it is becoming increasingly important to develop facilities to adequately handle them. Tourism is following the pattern predicted in the Master Plan but development of public facilities is lagging.

В. Refuge Visitors

- Ashton Brann, M&E, Helena (numerous visits) Jan. 8
- Don Dodge, Missoula, photographer (photos)
- Norton Miner, Wildlife Services, Billings (numerous visits)
- Bob Blom & Norman Warneke, Malheur Job Corp (courtesy visit) Feb. 28
- Apr. 11 Gordyn Crofoot, Arlee; Orin Scammon, St. Ignatius; & Ken Esterby, Charlo (plans for annual Saddle Club Ride)
- K.D. Swan & Ralph Hand, Missoula, photographers & writers (numerous) Apr. 14
- Apr. 18-20 Leon Stumpff, Bend, Oregon, photographer (numerous visits)
 Apr. 22 George Buckovatz, U.S. Marshall (looking for Job Corp enrollees)
- Charlo Biology Class, 37 students (tour) Apr. 25
- Ben Gates, Employment Service, Polson (numerous visits) Apr. 29
- May 2 Coeur d'Alene Junior College, 17 students (tour)
- May 3 Lima 2nd & 3rd grades, Lima, Montana, 35 students (tour)
- May 5 Columbia Falls High School, Montana, 50 students (tour) Dr. Baily & Professor King, University of Montana (courtesy) May
- May 6-7 Mr. & Mrs. John Fowler, Kelly, Wyo., (photos)
- May Proctor School, Montana, 17 students (tour)
- May 9 Jay Fleming, Ed Case, Dick Morrison, Larry Barkes, NASA, Radiation, Inc., Florida (discuss elk tracking project)

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May 9
         Dr. Bart O'Gara, Coop. Research Unit, U of M (numerous visits)
         Special Education Classes of Lake County, 50 students (tour)
May
         Mr. & Mrs. Larry Barsness, University of Montana (photos)
May
         St. Ignatius 8th grade, 30 students (tour)
May 12
May 14
         St. Ignatius Geology class, 40 students (tour)
May 15
         Polson 5th grade, 60 students (tour)
         C. R. Smith & Herbert Wellington, Washington D.C. (courtest)
May 17
May 17
         Prof. Mel Morris, University of Montana (numerous visits)
         Joe Zacek, S.C.S., Missoula (numerous visits)
May 17
          Polson Government Class, 80 students (talk)
May 19
May 21
         Ronan 4th grade, 60 students (tour)
May 22
         St. Ignatius High School, 40 students) (tour)
May 22
         West Glacier 3 and 4th grades, Montana, 17 students (tour)
         Ronan 1st grade, 50 students (tour)
May 22
May 23
         St. Ignatius 1 - 4th grades (picnic)
May 29
         Cherry Valley 5th grade, 31 students (tour)
May 25
         Saddle Club Ride, 210 riders
         Larry Osburnsen, Louis Moos, Rich Hager, Bob Ross S.C.S. (range)
June 19
         Dan Jones & Bob Carthwaite, New York, NBC (film Charles Russell doc.)
June 19
June 19-20 Dr. & Mrs. William Parker, Hightstown, New Jersey (photos)
June 20
         St. Ignatius Head Start class, 25 students (tour)
         Gentlemen on Horseback, Spokane, Washington (ride on range)
June 21
         Tom Smith, Realty, Portland & Bob Miller, Glasgow, Wetland's
June 23
         Acquisition (discuss Pablo & Flathead Lake)
June 24
         Bill Bair, Upham, N.D., Biologist (courtesy)
June 24
         Stan Federman, Portland Oregonian, writer (courtesy)
June 24
         Thompson Falls grade school students, 12 (tour)
June 27
         Dwight Stockstad, Art Brackebusch, Hal Anderson, U.S.F.S., Missoula,
         and Phil Cheney & Romo Paehban, Melbourne, Australia, Forest Research
         Institute (courtesy)
July 1
         123rd Scout Troop, Calgary, Alberta (tour)
         Don Meier, Marlin Perkins, Stan Brock, Ace Moore, "Wild Kingdom",
July 10
         (filming for TV show "Wildfire")
         Troop 679, Bozeman, Montana (tour)
July 14
July 15
         Mr. & Mrs. Allan Cruikshank, Fla., Audubon Society (photos)
         Ronan 4-H group. (tour)
July 20
         Bob Carroll, Helena, F & G, I & E, (photos)
July 24
         YWCA group of 45 (tour)
July 24
July 29
         Larry Linnard, Maumee, Ohio (photos)
July 29
         Mr. & Mrs. Dave Wood, Montrose, Colo., writers (photos)
         Bill Browning, State Chamber of Commerce, & George Laycock,
July 31
         Cincinnati, Ohio (photos)
         Newport, Washington Freshman & Sohpomores, 18 (tour)
July 31
July 31
         Dr. Harold Heady, U. of Calif, Range Mgt. (range study)
         Donald B. Hyatt, Budd Wilds, Simon Avnet, Thomas Landi, NBC,
July 31
         New York (filming 'West of Charles Russell' documentary)
         Jim Ludwig, U. of Alaska, (working on film on Blackfeet Indians)
Aug.
         U. of Montana Indians, 10 (tour)
Aug.
         Joshua Zulu, Mekuris Tafesse; Ethipia, Kiruthin; Kenya, K. K. Karam;
Aug. 17
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Aug. 18 Mr. & Mrs. John Hurchens, Rye, New York, writers (photos)

(Interior Dept. tour)

Ghana, C. L. Kabenji (all African students) & Jack C. Dodd, escort

Aug. 20 Erwin Bauer, Ohio, writer (photos)

Sep. 10 Lark Productions, California (filmed for lecture tour)

Sep. 18 High School Forestry group of 30 (tour)

Sep. 24 Noxon 5th & 6th grades, 24 (tour)

Sep. 23-25 Jack Waddell, Jim Lankford, O&M inspection

Oct. 6-7 Steve Moore, AP, Helena & Harley Hettick, Missioulian, (pictures and story of roundup)

Oct. 6 Larry Barness, U of Montana, (photos of roundup)

Oct. 6 Bob Woods, Kalispell, artist (photos of roundup)

Oct. 6-7 Marge Anderson, Ronan, Missoulian correspondent (story of roundup)

Oct. 6 Special Education, Missoula, 40 students (roundup)
Oct. 7 St. Matthews School, Kalispell, 6th, 7th, 8th grades, 70 (roundup)

Oct. 7 Mt. View School, Missoula, 12 students (roundup)

Oct. 7 Evergree 8th grade, Kalispell, 76 students (roundup)
Oct. 7 Special Education, St. Ignatius, 16 students (roundup)

Oct. 11-12 Montana State University Range group w/Don Ryerson (range study)
Oct. 30 Ken Greer, F & G, Bozeman, (elk and deer blood & etc. samples)

Nov. 2 U of Montana Wildlife Club, 30 students (tour)

Numerous visits were made during the year by local personnel from Wildlife Services, Soil Conservation Service, Bureau of Indian Affairs, Bureau of Reclamation (irrigation & power), Tribal Council, State Fish and Game, County Extension office and Fisheries Services.

C. Refuge Participation

Kaschke

Feb. 6 Gave presentation on Big game management to 30 big game students at University of Montana.

Mar. 11 Attended Technical Action Panel meeting in Kalispell.

Mar. 18 Attended annual state Fish and Game coordination meeting and Refuge Managers workshop in Helena.

Apr. 21 Assisted Polson Outdoors Club w/installation of goose nests at Pablo.

Apr. 23 Conducted tour of Ninepipe for Missoula Garden Club.

Apr. 24 Attended Salish-Kootenai Tribal Council meeting concerning recreation developments at Ninepipe and Pablo.

Apr. 26 Attended Polson Outdoors annual banquet and meeting.

Apr. 29 Presented talk to Wildlife Club (20) at University of Montana.
May 6 Keynote speaker at Charlo High School Honor Society initiation.

May 27 Appeared with Extension Agent Bratton on 15 minute TV program for KGVO, Missoula.

June 6-8 Attended annual Wildlife Federation meeting in Laurel, Montana. July 4 Assisted Charlo Lions Club with fireworks display for community.

July 26Aug. 3 at Charles Russell Wildlife Range assisting

Aug. 3 at Charles Russell Wildlife Range assisting with orientation of new Range Conservationist, Bill Krantz.

Aug. 28 Presented hour program to Polson Lions Club.

Sep. 10 Attended banquet meeting of Wildlife Federation Recreation Coordinating Committee.

Sep. 23 Meet with Science teachers attempting to establish programs for various age groups.

Sep. 25 Presented 30 minute TV program for KCFW, Kalispell.

Oct. 11-12 Conducted two day tour for 20 range management students from Montana State University, Bozeman.

Oct. 28 Presented slide program to University of Montana Wildlife Club (70).

Nov. 20 W/Barber, participated in Federal Career Day at the U of Montana.

Dec. 4 Attended Missoula Federal Businessmen's Association noon luncheon in Missoula.

Also attended four monthly meetings of Western Montana Fish and Game Executive Committee throughout the year and attended bi-weekly meetings of Charlo Lions Club. Conducted numerous school tours, participated in two Saddle Club rides and conducted numerous tours and interviews for writers, artists and photographers.

Barber

Feb. 17 Attended Science Fair Judges orientation, Ronan.

Feb. 19 Attended Financial Aid Workshop (work-study), Missoula.

Feb. 22 Judged at Ronan Science Fair.

Mar. 17 Talk and film for 440 St. Ignatius students - "This is a Mallard".

Mar. 17 Talk and film for 100 Dixon Students - "This is a Mallard".

Mar. 18 Attended Lake Co. Conservation Day - Polson.

Mar. 19 Talk and film for 350 Arlee students - "This is a Mallard".
Mar. 20 Talk and film for 27 Moiese students - "This is a Mallard".

May 25 Rode in annual Saddle Club Ride.

Jun 9 Slide talk for NYC organizational meeting, St. Ignatius.

Jun 18 Talk and tour for 20 member of Missoula Garden Club.

July 4 Assisted with Charlo Lions Club community fireworks display.

July 10-15 Assisted with filming of "Wild Kingdom" series.
July 31 Interviewed on KGVO radio "Travel Time in Montana."

Nov. 20 W/Kaschke, participated in Federal Career Day at the U of Montana.

Dec. 9 Slide talk for Charlo Lions Club

Dec. 15 Assisted in Christmas Decoration of Charlo w/Lions Club.

Also attended regular meetings of Charlo Lions Club. Conducted numerous school tours and tours and interviews for writers, artists, photographers.

May

Mar. 18 Showed movie "This is a Mallard" to Charlo School.

May 25 Rode in annual Saddle Club Ride.

Jun. 9 Helped present slide talk for NYC organizational meeting.

Jun. 12 Interviewed by David Dary, writer.

June 21 W/Gentlemen on Horseback, tour of range.

July 10-15 Assisted with filming of "Wild Kingdom" series.

Sept. Conducted N.R.A. Hunter SAFETY Course.

Attended regualr meetings of Masonic Lodge and Charlo PTA. Conducted numerous school tours and interviews for writers, photographers.

Hogge

Served on Boy Scouts Council for National Jamboree Committee.

Chairman of Boy Scout District Leadership Training.

Served on Boy Scouts Council for Leadership Training Committee.

Chairman of School Board District #28 and on School Board Personnel Policy Committee.

Conducted various refuge tours for school groups, writers and photographers.

Kraft

Organized and directed a "Laugh In" variety show for the Charlo PTA fund raising drive. Served as director for summer recreation program for 100 school age children. Coached one baseball team. Conducted various tours for school groups, writers and photographers.

Krantz

Presented slide talks for Ninepipe 4-H Club, St. Ignatius Jaycees and Ronan Boy Scouts. Conducted numerous on-refuge tours for school groups, photographers and writers. Member of Moiese, State and Pomona Grange, Lake Co. Development Council. Rode with Gentlemen on Horseback.

Middlemist

Served on School Board for District #9, 4-H leader and member of 4-H Council for Sanders County.

Scammon

Showed Bison Range movie to Jocko Rangers 4-H Club. Conducted two on-refuge tours for school groups. In the Regional Office for four-day orientation and training session in May. Took part in Defensive Driving Course. Participated in St. Ignatius Jaycee - Jayceen activities and projects. Rode in annual Saddle Club Ride.

Publicity of the Bison Range and activities was again astounding. Three national TV shows, NBC's Animal World and "The West of Charles Russell and Mutual of Omaha's Wild Kingdom, depicted scenes or mentioned the area. An Associated Press release of the roundup by Steve Moore was carried in many leading newspapers throughout the United States. We have received clippings from 25 papers, including the Stars and Stripes. One article and a list of the papers from which clippings were received are included at the back of the report. All releases were similar. Many well known photographers, writers and artists also visited the area.

Refuge personnel made periodic news releases to local papers and appeared on local TV and radio programs, as shown above.

D. Hunting

There is no public hunting on the Bison Range. General waterfowl and upland game bird hunting conditions in the Flathead Valley have been discussed in the Nnepipe and Pablo narrative report.

E. Fishing

High and muddy water periodically throughout the summer made fishing on the Jocko difficult. This fine trout stream is continually being straightened and altered by adjoining land owners. We have dozed some large boulders into straightened stretches and find it soon provides excellent fish habitat. Plans are to continue this habitat work. An estimated 2150 man days of fishing was recorded on the portion flowing through the Range but outside of our fence. Fishing could be described as good when water was clear.

F. Violations

The only known game violation was during early October, when one evening a passing motorist shot a fawn deer from the road. Foreman May heard the shot but was unable to get to the scene quick enough to apprehend the violator. Refuge personnel hid nearby in hopes they would return to get the trophy 26 pound fawn. Unfortunately, they never returned.

G. SAFETY

Scheduled SAFETY meetings and the main topics of discussion were as follows:

- Jan. General SAFETY practices were discussed, including ice and snow covered walks and driveways. Chances of carbon monoxide poisoning in winter weather were also discussed.
- Feb. "Ice Rescue", an article from Family SAFETY was reviewed. SAFETY precautions for the winter were discussed.
- Mar. The psychological attitude of SAFETY was the main topic. Articles entitled "Panic Preventors" and "18 Ways a Good Supervisor Puts SAFETY to Work" were reviewed.
- Apr. Primary and potential poisons were the main subject. The importance of labels and keeping medicine and household cleaners out of reach of children was discussed.
- May Refuge fire plan and fire fighting agreements and policies were discussed. A briefing was held on the operation of fire fighting equipment.
- June The film "Everywhere, All the Time" was viewed and discussed. Also discussed were causes of farm accidents.
- July Water SAFETY, including boating and swimming and related hazards, were the main topics. The station fire plan was discussed, with emphasis on fire drill procedures.
- Aug. An article entitled "Are You Accident Prone", from the <u>Readers</u>
 <u>Digest</u>, was reviewed. An accident involving a refuge vehicle
 and employee was discussed.
- Sept. The film "Wheels of Tragedy" was shown and discussed. SAFE driving practices were reviewed.
- Oct. Hunting SAFETY was the main topic. An article from Family SAFETY was discussed.
- Nov. SAFE winter driving practices were the main subject. A general discussion of hints and personal experiences followed.
- Dec. Fire dangers in the home was the topic. A demonstration was presented, showing what happens when a fire begins in a house.

While closing the tour route August 4, our student trainee decided to take a side trip to Ravalli Ponds to prevent hurrying a group of tourists ahead of him. He had proceeded about 100 yeards on the detour and saw an object in the road. He stopped and walked back to get the item. The vehicle was left in fourth gear instead of second and the emergency was not on. The unattended pickup rolled about 300 yards, went into a gully and flipped over. Fortunately no one was injured but it cost nearly \$600.00 to repair the vehicle.

VII. OTHER ITEMS

A. Items of Interest

1. Training

- Mar. 17-21 Hogge attended a five day Heavy Equipment school at Kinkinghorse Job Corp Camp, conducted by GSA.
- May 12-15 Scammon was in the Regional Office for four days of orientation and training.
- July 8 The GSA Defensive Driver's Training was Attended by Clerk Scammon, Laborers McVey and Wetzel, Work-Study Employees Barnier, Knudsen, Borden and Student-trainee Hedges.
- Dec. 19 Hogge attended a one day training session of field repairs of snow mobiles and overhaul of two-cycle engines. The session was sponsored by Forest Service and conducted by snow mobile manufacturers.

2. Miscellaneous

Robert L. Barber, former Assistant Manager at Benton Lake, accepted the newly established GS-9 Assistant Manager position at the Range. He and his wife, Julie, and two sons, Michael and David, arrived January 9. The Refuge has benefitted greatly with the addition of the Barbers.

Wedding bells were ringing in the chapel on August 8, and this time they were for our Clerk Sharon Oxford, who is now Mrs. Warren Scammon. We wish them a long and successful marriage.

Dave and Lynn Kitchen arrived May 6 to conduct his antelope behavior study. They finally found housing in Ronan and settled for the summer. The Kitchens returned to school at the University of Michigan, October 8.

Bison Range personnel participated in two Saddle Club rides on the Range. One group was the local St. Ignatius club with 210 riders from western Montana. The other was a group from Spokane, Washington with 80 riders. Rides were conducted May 25 and June 21, respectively.

B. Credits

Kaschke - those sections and items not listed below.

Barber - all of part II, Wildlife, part V, J, all NR forms, including typing.

May - all of part III, Refuge Development and Maintenance

Scammon - all of part IV, Resource Management, part VI, B, C, and G. Typed entire report (except NR forms).

All personnel contributed to collection of field data essential to the preparation of this report.

C. Photographs

Credit for the various photograph	ns is given in each caption.
	Submitted by:
	Marvin B. Kaschke (Signature)
	Refuge Manager (Title)
Date:	
Approved, Regional Office:	
Date: 2/27/70	
(Signature) Samplan	
Asst. Reg. Ref. Super.	

Refuge National Bison Range

Months of January

April

, 19 69

(1) Species	(2) Density	d in re	(3 You Produ	ng	(4) Sex Ratio	R	(5) emova		(6) Tot al	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Restocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
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olumbian Sharp- ailed grouse	12,000 A mixed cov.				blooms see	nuov	30 1	edmun	bedsel5 all	Introduced from Idaho, 04/27/69, 3 female, 12 male.
ing-necked pheas.	2000 A grassland & bottoms		i eyes	nus l	ng habitat.	mirzg	aell	n apg		(4) SEX RATION
hukar partridge	6000 A mixed cov.		bayos	97 Y					20	Severe losses this winter
NA.	ort period. This m singe during certai		aring og int	b egg	ting the refr lus those mig	de p	emun tid j	total sider	Batimated	(6) TOTAL:
Also		d area cally r	ion an	ulat ot s	letermine pop	to i	nsed ertin	ethod	n especial to ebulani	(7) REMARKS:
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1613							8.			

INSTRUCTIONS

UPLAND GA) BIRDS

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Form NR-2 - UPLAND GAME BIRDS.*

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(+	.) SPECIES:	Use correct common name.		Young (3)	(2) Density	
(2		Applies particularly to th	ose specie	s considere		
tion	Pertinent informate specifically required that introductions	hunts, etc.). Detailed da numbers. Density to be exp information is to be prefa number of acres in each co information need not be re	ta may be cressed in a ced by a sever type for executed exceptions.	omitted for acres per a statement fr ound on the ept as sign	species occurring in liminimal by cover types. This om the refuge manager as the refuge; once submitted, the ificant changes occur in the species occur in t	ted so the chis che area
wat all	Introducing form In	of cover types. Cover type information but not so much swamp, upland hardwoods, regrass prairie, etc. Stand No. 7 should be used where observations and counts on size of sample area or are	th as to observerting a lard type so possible. The represent	scure the g griculture ymbols list Figures s ative sampl	eneral picture. Examples: land, bottomland hardwoods ed in Wildlife Management ubmitted should be based of areas. Survey method us	spruce , short Series on actual ed and
(3) YOUNG PRODUCED:	Estimated number of young in representative breeding		based upon		unts
(4) SEX RATIO:	This column applies primar other species if available		d turkey, p		
(5) REMOVALS:	Indicate total number in e	ach catego	ry removed	during the report period.	eghbrirse restal
(6)) TOTAL:	Estimated total number usi include resident birds plu				ay
(7)) REMARKS:	Indicate method used to de include other pertinent in				Also

^{*} Only columns applicable to the period covered should be used.

Refugelational Bison Range

Months of May

to August

, 19 69

								E BIRDS.*	Form NR-2 - UPLAND GAM
(1) Species	(2) Density	in rea	(3) Young Produced	(4) Sex Ratio	R	(5) emoval		(6) Tot a l	(7) Remarks
Common Name	Cover types, total acreage of habitat		Number broods obs'v'd. Estimated	Percentage	Hunting	For Restocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Crouse Grouse		neral and, b d in W bmitte	5 60	reverting agri dard type symi e possible. I n representati	Stan wher		90 D	90	Aug. brood size 5.0 Two observations
	12,000 A mixed cove	bserva	ed upon	g habitat.	nthe	nd en	umbe tati	15 (7) 50	Several observations of single birds and unconfirmed sighting at 15 + which may have been a brood Few observations
nukar partridge ray partridge	and bottoms 6000 A mixed cover- 12,000 A mixed cov		2 40	.0	idsi.	svs	i se tal	68	Aug. brood sise 13.5 Aug. brood sise 12.5
	ort period. This m								(6) TOTAL:
Also				etermine popul niormation mot					
			bei	a should be	rere	o bo	per	able to th	* Only columns applic
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Refugeistional Bison Ha

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES:	Use correct common name.	(3) (4) Young Sex	(2) Density	(1) Species
(2) DENSITY: n noldsmædti tne betseuper vilselt ersd sneltoberin	hunts, etc.). Detailed da numbers. Density to be exp information is to be prefa number of acres in each co information need not be re	ata may be omitted for pressed in acres per an aced by a statement fro over type found on the epeated except as signi	in removal programs (public species occurring in limited imal by cover types. This m the refuge manager as to t refuge; once submitted, this ficant changes occur in the enough to furnish the desire	the area Marketo
0.2 sale boo ervations of	information but not so muc swamp, upland hardwoods, r grass prairie, etc. Stand No. 7 should be used where observations and counts on size of sample area or are	th as to obscure the geneverting agriculture lard type symbols listed possible. Figures surpresentative sample	meral picture. Examples: sp and, bottomland hardwoods, s d in Wildlife Management Ser bmitted should be based on a areas. Survey method used	oruce short ries actual
(3) YOUNG PRO	DUCED: Estimated number of young in representative breeding		bservations and actual count	the same of the sa
(4) SEX RATIO	other species if available		easants, etc. Include data	on sig bostoon-gubil
(5) REMOVALS:		ach category removed d	uring the report period.	Gray partridge
(6) TOTAL:			he report period. This may the refuge during certain s	easons.
(7) REMARKS:	Indicate method used to de include other pertinent in			so

^{*} Only columns applicable to the period covered should be used.

Refuge National Rison Range Months of September to December , 1969

(1) Species	(2) Density	aw n.F.b	(3) Young Produced	(4) Sex Ratio	R	(5) emova		(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Bird	Number broods obs'v'd. Estimated Total	Percentage	Hunting	For Restocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
ichardsen blue grouse	2,000 a. conifer	enougrafication of the second	cure the gridual course the gridual tune mbols list	thes should the as to ob reverting a start type start t	so m ods, Sta whe	, nde beeu	fud n d bus e in ed bi	grass prad No. 7 show	
oluebien sharp-	bottom	evicedo	tive sample to indicate mased upon			20 1		15 at 15 at	No observations this period
ing-necked no ad phosent	2,000 a. grass & stress botton	tassen	i tum cay y	ng habitet. urily to wilde. .c.		rd ev Lise I ava		nelo 200 m	(A) SEX HATTO:
buker pertridge	6,000 s. mimedend			each categor		edmyn o'mon	Lede		Purther brood observations aft Sept. 1 indicate minimum of si broods, svg. 8.7 years
rey partyldge a c	12,000 a. mimed its	n edf d sens l	rating int ulation an	gint sport au	0.7	b bir used artin		n edsoibal	(7) REMARKS:
	* nan sen he					*	,		
			nsed	ed bluode b	1977	o bo.	meg e	ns of alca	* Only columns appli
								5	

INSTRUCTIONS

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Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES:	Use correct common name.				(1) Species
(2) DENSITY:	Applies particularly to the	hose species	considered in	removal programs (pu	blic
Pertinent information not specifically requested. List introductions here.	hunts, etc.). Detailed danumbers. Density to be experinformation is to be prefarumber of acres in each conformation need not be reof cover types. Cover type information but not so much	pressed in a aced by a st over type for epeated excepts should be	acres per animal tatement from the bund on the refu ept as significa be detailed enou	by cover types. The refuge manager as ge; once submitted, nt changes occur in gh to furnish the de	is to the this the area sired
	swamp, upland hardwoods, a grass prairie, etc. Stand No. 7 should be used where observations and counts or size of sample area or are	reverting ag lard type sy e possible. n representa	riculture land, mbols listed in Figures submit ative sample are	bottomland hardwood Wildlife Management ted should be based as. Survey method u	s, short Series on actual
(3) YOUNG PRODUCED:	Estimated number of young in representative breeding	produced, h	pased upon obser	vations and actual c	ounts lada god kaliba
(4) SEX RATIO:	This column applies primar other species if available		l turkey, pheasa	nts; etc. Include d	ata on
(5) REMOVALS:	Indicate total number in e	each categor	y removed during	g the report period.	eghiziyeş welkiD
	Estimated total number usi include resident birds plu				
(7) REMARKS:	Indicate method used to de include other pertinent in				Also

^{*} Only columns applicable to the period covered should be used.

Refuge Matienal Misea Range Manage Calendar Year 1969

(1) Species	(2) Density	(3) Young Produced	ung Removals			(5) Losses			(6) Introductions		(7 Estime Total 1 Popular	(g) Sex Ratio		
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	Post
Moen anol	iffe Management Series No.	101		a dire	79	50	53	3		11.53 1200	prairie,	BATA 150	339	100:01
10k	5,000 a. conliter & grees	adjes ver	Kari U	21 .a	15	ole a er Re	mas bau	67 66	en ta ti	pres be 1	counts on re	bna 68	53	100181
Nale door	10,000 a. esaif., brush, gra	guletto	be s	200	80		1	1	sus La	tos	e Intinated	100 TO 505	UOY 217	100:10
White-taile	\$,000 a. Coulf, brush,gra	us sales	F 7	n og 6	46	doss	1	2	imu a 1	83 03	at sto	246	189;	100110
Bighorn sho	8,000 a. craifer & grass	estimat 10	tda	tlen	7.0						On the ba	43	eol (a)	Unknow
Antolpeo	6,000 a. grassland oods in	My Alex	600	age	20	3					Indicate	100 100 TO	114	100133
Mt. gent Toma leng-	2,000 a. conifer	no settes on	201	eack Ded	120 30	tion- so &s	slo fa	jus šod	8	esti abus	Give the greatest	HOUSE IN	POT (1)	Uniteres .
hoya stoor	ich species as determined fa	e to asia				lam 1 dauc	a a				ejspibul field ob	EATIC:	XE8 (8)	

Remarks: • 1 bull, 1 cov, & 3 calves disposed of due to injuries - ment salvaged & denated to mehool bet-lunch program through Confederated Saligh and Kooteani Tribes.

Reported by _____

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Form NR-7 - BIG GAME

(8)

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- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisians white-tailed deer.
- DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.

Reported by

- (4) REMCVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE
 POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIC: Indicate the percentage of males and females of each species as determined from field observations or through removals.

Remarks: a tests, i core, a 3 calves disposed of due to injuries - ment solvened to decated to select lust-lumeh progress

engones Controloguesed Series and Macconst Trabes.

SMALL MAN__LS

1945) Refuge Actional Bicon Range Year ending April 30, 1969

(1) Species	(2) Density	le:	(3) Removals					(4) Disposition of Furs						
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Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hun ting	Fur Harvest	Predator Control	For Re- stocking	For Re-	Permit Number	Trappers Share	Refuge	Total Ref Furs Ship	Furs Done	Furs	tion
yote	15,600 A all habitat	r anisal	eq s	9108	ni in	98887	(Z2) 0	f os ysb	201	· · · ·	E1 14	н		10
beat	the refuge manager as the refuge; once subs	morl in		aja	s yd	faced	arq s	d of at	20 £3					5
The second secon	2,560 A Staronn bolaten	found or sed excep			roo r	n eac	res 1		n Politi					45
deimui o	10,000 A Grassland	unda se		1870	- 15		tevos		the					35
.51.07.10	THIS HAN SUI SINGSHE OF	much as		not		olism	infor	desired	the					
	100 A Street better	dwoods,					pruce							5
	Standard type symbols used where possible.	i, elc.						hardwoo	land ve sv					10
	50 A wetland on bon so			e tus	aay:			Lucia ba						36
Markelly Parent	2000 A missel falsters	esta bui		en b				ine areas						100
renalina	7068 V @ @				6	omark	i reb	cated un	tod					10
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	r, trapper's share, ar									SUE ECE	MOIT	\$20S)	E (11)	
	ket, including fure te													
	pecies destroyed becau													
ner pReneres	to institutions or of						,	is ad hi	ness					
· List removals by	Predator Animal Hunter			M. AARIN	1200	U-149 11	1140	No on DA	LU118					

REMARKS:

Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

Reported by Robert L. Barber

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

(1) SPECIES:

LatoT

no ld

Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc.

(Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY:

Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS:

Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR:

On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

" List removals by Predator Animal Hunter

(5) TOTAL POPULATION:

Estimated total population of each species reported on as of April 30.

REMARKS:

Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

3-175	7 - (
Form 1		
(Rev.	June	1960)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge		Year	19	-69
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	(See			s and Recks, tre				(Plant M ars h - Aqua)		
Species	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
Timothy Alta feam Yest wheat East blue	2004		Sept	Supplu	0	2008 158 258 158	Emhib. Past.	28/0	à acres		July	Calmara	

Report agronomic farm crops on Form NR-8 C = Collections and R = Receipts	Remarks:
3) Use "S" to denote surplus	
otal acreage planted:	
Marsh and aquatic Hedgerows, cover patches	
Food strips, food patches	
Forest plantings	

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

eperiodic cultivation for grass hay and igrigated masture

CULTIVATED CROPS - HAYING - GRAZING

0.2444.3		ittee's		Government's Share or Return Harvested Unharvested				Green Manure,		
Cultivated Crops Grown		Share Harvested Acres Bu./Tons		Harvested Acres Bu./Tons		N 4 8 8 E		Cover and Water- fowl Browsing Crops Type and Kind		
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o. of Permittees:	Agricultur	al Onevation	nne	the parties of the contract of	Having	Operations	gogo lie teli - ke q geiftcoger ett er om qui hefesig med aldregen wol beside		Ag. Land	CS SCR. MACH PERTING NO.
o. or remittuees:	Agricultur	ar operation		er 8, 8, 915	naying	opera cions	Hogo	_ Grazin	En E	upe perso
Hay - Improved	Tons Harvested	Acres	Cash	The second second	RAZING	Num Ani	ber mals	AUM'S	Cash Revenue	ACREAGE
(Specify Kind)		1. A 16		1 1 1	Cattle	# 5 to 2			10	
(Specify Kind)				行為の意情		a less sole test or				
(Specify Kind)	27.13	80			Other			24	400.00	Ma
(Specify Kind)	27.13	80	-	2.	2200	efuge Acres	age Under (24 Cultivati		NA.

DIRECTIONS FOR PREPARING FORM NR-8 CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under <u>Cultivated Crops</u>, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

REFUGE GRAIN REPORT

(1)	(2) On Hand	(3) Received	(4)		GRAIN DI	5) SPOSED OF		(6) On Hand	Propose	(7) Proposed or Suitable Use*		
VARIETY*	BEGINNING OF PERIOD	During Period	TOTAL	Transferred	Seeded	Fed	Total	END OF PERIOD	Seed	Feed	Surplus	
	010						310	166		165		
30	200	215	195	es brobosi		310	200	165		309		
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		atable tor	mun Sangas	proble				in Male				
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	(6) Col	mm 4 less t	oluma 6.									
	(4) A ti	and of colum	ans 2 and 3,									
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(8)	Indicate	shipping	or	collection	points	
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(9) Grain is stored at

(10) Remarks
*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.

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- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

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Refuge

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number | Reporting Year

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Applicatio
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5/3-7/16	Canada Thistle	Readside & pienie area	51	2,4-D Amino	25.5 cal	of Acid Equiv.	Water 1:100	Ground
n -9	it, John'swort	Upper & Lover West	882	2,4-3 Amino	Akt gal	8 Acid Equiv	Water 1:3	erial
,								

^{10.} Summary of results (continue on reverse side, if necessary)

Canada Thistle - excellent apparent kill, extent of long range control is questionable

St. John'swert - apparent kill 80 -90%

INTERIOR -- PORTLAND, OREGO

1.

REPORT ON THE PRELIMINARY RESULTS OF A STUDY OF THE SOCIAL BEHAVIOR OF THE PRONGHORN ANTELOPE

by

David W. Kitchen and Dale R. McCullough

Department of Wildlife and Fisheries School of Natural Resources University of Michigan, Ann Arbor November 15, 1969

INTRODUCTION.

This interim report covers the period from May 7 to October 5, 1969 during which work was conducted on the National Bison Range, Montana. The purpose of the study is to describe and analyze the social behavior of the prenghorn antelope, and its relationship to other animals on the range. The field work was supported by grants from the Wildlife Management Institute, Washington, D.C., and the Welder Wildlife Foundation, Sinton Texas.

INTRASPECIFIC BEHAVIOR.

Four hundred and twenty hours of actual behavior observations were accumulated. So far, \$\mathbf{4}\cent{2}\$ behavioral acts have been described, but their variations and temporal patterns have not been fully analyzed. More observations are needed to adequately quantify certain acts, especially those between does and fawns early in the fawning season, as well as doe-buck and buck-buck acts during the breeding season.

Comparisons of certain pronghorn displays with those of other large ungulates show some interesting similarities. A good example is the pre-copulatory cheek patch display of the pronghorn buck. He approaches a doe with a high stepping prance, head held high and turned to the side, thus displaying his cheek patch, neck arched, mane partly erect, hairs around the medial rump gland erect, and occasionally with his rump patch erect as well. This pre-copulatory display is similar to the "prancing" display of the Uganda Kob(Buechner and Schloeth, 1965) and the promenade displays of Thomson's and Grant's gazelles (Estes, 1967). Bigalke (1963) has noted that the pronghorn is the closest ecological counterpart of the springbok and that they show not only similarity in behavior and habitat preference, but convergence in morphology such as an enlarged rump patch. Since the genetic relationships of these true antelopes to the pronghorn are very remote, similarities in displays are probably due

to similarities in environment and habitat and not to common ancestry. Further observations of pronghorns are necessary to build a body of data similar to that available for the true antelopes so that comparative studies could be attempted. This should help clarify the role of habitat in the selection for certain types of animal displays.

At first glance the prominent white markings on the pronghorn's head, neck, and body appeared to be quite uniform. It became evident, however, that these markings were highly variable and may allow individual recognition of the entire population. Potentially this may be quite valuable, if the marks do not change with seasonal molts, as it would make it possible to follow the activities of the individual bucks and does for the entire study. Thus, the breeding success of individual bucks could be documented over a two year period. This type of information will help in clarifying the role of territoriality in the pronghorn's breeding system.

Pronghorns have been described as being both territorial and harem breeders. Harem breeding has been reported in Texas by Buechner (1947), in Wyoming by Gregg (1955), and in Oregon by Einarsen (1948). Cole (1956) first described territoriality in central Montana and subsequently Bromley (1969) has reported territoriality at the National Bison Range in western Montana. These reports come from very different habitats and may represent inter-population variations in pronghorn breeding behavior.

The nature of the territory seems to be quite variable and pronghorns may be territorial throughout the year or may desert the territory to attend and breed an estrus does (Cole and Wilkins, 1958). My field observations for the 1969 rut indicate that elements of three types of breeding behavior may occur in rutting pronghorn bucks. Early in the breeding season (late August to about September 10) the bucks showed elements of both territorial and harem breeding behavior. During the actual breeding period, i.e. when copulations were occurring, (about September 17 to October 7) the interest of the master bucks seemed to

shift primarily to the does. Does were actively herded and defended. Also the territorial area defended by a master buck was reduced to the immediate vicinity of the doe group. When bachelor males were numerous and aggressive a master buck would usually defend only the estrus doe and may have formed a temporary tending-bond with her. On three occasions master bucks "tended" estrus does even though they lost their harems as a result. Further observations are needed to clarify the circumstances which result in a territorial, harem, or tending bond response by the master buck.

Dasmann and Mossman (1962) reported territoriality in Southern Rhodesian impala, while Schenkel (1966) found that in southern Kenya they breed in harems. This variation in behavior has been related to differences in environmental factors, such as weather and feeding conditions (Leuthold, 1966). Thomson's gazelles show both territorialtry and harem behavior in the same population (Brooks, 1961). As already noted, pronghorns show a wide variety of breeding behavior and may have both between and within population variabilty. The situation at the National Bison Range, with a high variation in breeding behavior, may provide an opportunity to clarify the environmental and behavioral components that affect selection for territorial and harem breeding systems.

Buechner (1963) has noted that habitat stability is a requirement for the territorial breeding system in the Uganda Kob. The study of two pronghorn populations under different environmental conditions, as planned in this study, may clarify the concept of habitat stability fostering territoriality. Also it may be possible to find out what elements of the habitat are essential to territoriality in the pronghorn and other species as well.

The nature of territories in large herbivores is quite diverse. Uganda kob breed and defend territories throughout the year (Leuthold, 1966), and kob females are responsible for mate selection. Topi (Vesey-Fitzgerald, 1955), lechwe, and puku (De Vos and Dowsett, 1966), Thomson's and Grant's gazelles (Walther, 1964 and Estes, 1967) display seasonal territoriality and defend both the ground and the female.

Waterbuck (Kiley-Worthington, 1965) and vicuna (Koford, 1957) are territorial throughout the year and defend only the ground area, but have a seasonal breeding season. A set of data on the pronghorn territory similar to those available for the above species would be of great value for comparative studies of territoriality in large herbivores.

Female pronghorns play an important role in the breeding system. Master bucks attempt to control females during the rut, but they are usually unsuccessful and does move from one harem to another frequently. These movements caused a number of conflicts between rival bucks and may have played a role in reinforcing the hierarchy that was noted in bachelor males. Only a few naturally marked does could be recognized readily and so the movements of individual does were not well documented. Six doe fawns were ear-tagged in 1969, and these, added to those already recognized, should clarify the role of the doe in the herd.

Males in bachelor herds established a rather rigid dominance hierarchy during the summer. Yearling bucks were all at the lower end of the hierarchy and larger bucks at the top. On no occasion did a yearling dominate an older male, but during the rut yearlings sparred with larger males that were low in the hierarchy. Bachelor bucks wandered a great deal during the rut and on occasion bred estrus does unguarded by master bucks. The highest member in the bachelor hierarchy present at the time bred these unguarded does and bachelors accounted for 21% of the 17 observed copulations.

Master bucks accounted for 79% of the known copulations. No master bucks were replaced by or lost control of their does to secondary males. Although these bucks spent much time chasing subordinate bucks and herding does (high energy activities), they were able to feed frequently. Master bucks appeared to lose some weight, but none became exhausted as do master bulls in elk (McCullough, 1969).

Two factors may be important in the lack of turnover observed in pronghorn bucks. First, pronghorns rut for six weeks and most of the breeding is concentrated into about two weeks in late September. McCullough (1969) reported a rut of about 12 weeks in elk, twice as long as the antelope, and breeding occurred during the entire period with most copulations occurring in the first few weeks. The shorter breeding season in pronghorns would certainly lower the probability of a buck being replaced. Secondly, pronghorn bucks on the Bison Range controlled smaller harems (1 to 16 does) than elk (15 to 60 cows) (McCullough, 1969), and so would have to spend less energy to control the females. These two factors together probably explain the ability of pronghorn master bucks to last the entire rut.

It was not possible to follow the full horn sheath cycle in the pronghorn and so no data dealing with the hypotheses of Geist (1966) and Goss (1964) concerning the evolution of horns and antlers were obtained. The prominent facial and upper neck markings of the pronghorn appear to play a more important role in individual recognition and precopulatory behavior than they do in threat displays. Pronghorns have a lateral threat display, and this orientation is consistent with the predicted orientation according to Geist's (1966) hypothesis concerning the relation between fighting behavior and threat displays.

INTERSPECIFIC BEHAVIOR.

In part, the geographical separation of the pronghorn, bison, elk, bighorn sheep, white-tailed deer, and mule deer has been clarified. Bison and pronghorns on the Bison Range frequented the same areas when the bison were held in the pastures used by pronghorns. While there appears to be little separation in habitat use there is a fair amount of behavioral antagonism between them. When a herd of bison feeds into an area being used by pronghorns, the antelope immediately leave the vicinity. Antelope are very nervous around bison and in one case a bison cow chased a pronghorn doe.

Mule deer were found in very different types of habitat than the pronghorn. Mule deer were concentrated in the Douglas-fir and spruce woodlands of the upper slopes while pronghorns used the open grasslands. On occasions mule deer were found in the areas bordering the grasslands

and did come into contact with antelope. No behavioral exchanges were noted between these two species.

White-tailed deer and pronghorns came into frequent contact in all areas used by antelope. This was especially true along the river bottom bordering certain grassland areas. Both species fed in the same areas frequently, but the deer spent the day from about 10:00 a.m. until about 5:00 p.m. in the river bottom, while the pronghorns remained in the grasslands all day. There is a high level of behavioral antagonism between white-tails and pronghorns and both often react aggressively when approached by the opposite species. In areas of overlap, behavioral mechanisms certainly aid in separating these species.

Bull elk frequented areas used by pronghorn herds in the summer, but cows were rarely evident at this time. Contact was rare, and pronghorns seemed to avoid elk when they were in the same area. Overlap occurred only in the early morning and at night, for during the day bulls stayed in the river bottom or the timbered uplands. Cows were seen only rarely and tended to use the higher grasslands and woodlands where only transient antelope bucks were seen.

Bighorn sheep were never observed in any areas that pronghorns used. Only one wandering pronghorn buck was seen in an area used by sheep. It would seem that ecological separation is based primarily on habitat selection, and behavioral or food habit considerations may be unimportant in this case.

So far the study has indicated that both habitat selection and antagonistic behavior play a role in the separation of some of these species. Difficulty in obtaining food habits data has been encountered and so the full degree and nature of their ecological separation is unclear at this time.

PROPOSED FURTHER RESEARCH:

Observation of free-roaming antelope will be continued, and documentation of acts will proceed as planned through photography with a 35 mm. camera. Tape recordings will be attempted and later analyzed with sonograms, especially in the case of the bucks' laugh call. Fawns will be ear-tagged again, but it is hoped that adults can be recognized by natural markings. A weekly spot light census will be continued through another year, and all animals observed will be recorded as to species and plotted according to location and habitat.

If the grazing rotation of the bison will permit, "forage-unit" studies of availability and utilization will be attempted in the areas which appeared to be "territories." These studies will also be used to clarify the interspecific relationships of the various species at the Bison Range. Fecal, observational, and rumen analysis will be carried out, as possible, to establish the food habits of the various species.

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A Summary Outline: 1969 Archaeological Study of the National Bison Range, Moiese, Montana

During the summer of 1969, Cecil D. Barnier, an anthropology major at the University of Montana, was hired under the Federal Work Study Program to conduct a preliminary archaeological survey of the National Bison Range. Mr. Barnier was under direction of the University of Montana Statewide Archaeological Survey.

The purpose of the project was to locate and recrod all archaeological sites within the boundaries of
the refuge. Recommendations were also to be made
concerning the protection and preservation or salvage of those sites located. A brief summary of the
study follows.

The National Bison Range lies in the Flathead

Valley near the heart of the vast western Montana region that was controlled during prehistoric times by

Salishan and Kootenai speaking peoples. Although little is known of the archaeology in the area, there is some evidence to suggest occupation over a considerable length of time. Small leaf-shaped projectile points are suggestive of Plains artifact types dating from 2,000 to 4,000 B.C., widely dispersed in the Flathead VAlley. One "Cascade type" blade or projectile point and the center section of a parallel oblique flaked blade have been found at MacDonald Lake some 10 air miles from the refuge. Elsewhere in Montana and Wyoming,

these two artifact types have been radiocarbon dated at 5,000 to 7,000 B.C. The age of those sites found on the Bison Range, however, fall much later in time.

Of the seven sites found on the refuge, three are possible eagle catching pits and two were occupation sites (campsites). Two placer mining sites were also located.

The small number of occupation sites found is probably due to two factors. First, camas, the root of which was a staple food of the Salish and Kootenai Indians, is not present in this section of the Flathead Valley. The lack of camas probably resulting in much lighter use of the area correlates with the type of sites found on the Bison Range. Here the scarcity of cultural debris and small scale of the sites suggest overnight stops by hunting or traveling parties, rather than longer stays such as were required for the collecting and preparation of the camas root. The second reason for the scarcity of located habitation sites is the extremely lush grass cover of the refuge. Since the method of survey employed was strictly surface reconnaissance, it is difficult to say that all sites were located because forage and grass cover have the ground well protected and hidden.

Among the more interesting sites are the several "pits" about 4 ft. in diameter and 3 1/2 ft. deep, located in talus slopes near the top of Red Sleep Mountain. This

mountain is the highest point of elevation on the refuge. Although more research must be done before any conclusive statement can be made, it is supposed that these sites were used by the Indians to catch eagles. In catching eagles, an Indian would place meat on the lip of the pit, crouch within it, and cover himself with grass or shrubbery. An eagle alighting to get the bait was grabbed, dragged into the pit and killed.

Moving now into the realm of historic archaeology, two apparent placer mining deposits were found on the Bison Range -- one at the mouth of Triskey Creek and at the mouth of Elk Creek. Again, more research needs to be done, but cursory evidence suggests that the deposits are remains of gold mine operations sometime close to the turn of the century. The disturbed area is small compared to some placer operations, but is large enough to suggest that some amount of wealth has been removed from the area.

A far more complete report is presently being prepared for publication. This final report will be submitted to the Bison Ranger Manager for approval before being published in a nationally destributed anthropological journal.

The administrative personnel of the National Bison Range have taken a pioneering step as far as Montana is concerned. Other than Yellowstone National Park, no other park or refuge in the state has seen fit to instigate a program for the protection and preservation of

archaeological sites within its boundaries. It can only be hoped that others will follow the example set by Moiese.

NINEPIPE AND PABLO NATIONAL WILDLIFE REFUGES

Narrative Report

January 1, 1969 to December 31, 1969

REFUGE PERSONNEL

These refuges are managed from the National Bison Range office.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
FISH AND WILDLIFE SERVICE
Moiese, Montana

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		PAGE
I.	General	1
	A. Weather Conditions	1
	B. Habitat Conditions	1
	1. Water	1
	2. Food and Cover	2
II.	Wildlife	3
	A. Migratory Birds	3 5 5 5 5
	B. Upland Game Birds	5
	C. Big Game Animals	5
	D. Fur Animals, Predators, Rodents and Other Mammals	5
	E. Hawks, Eagles, Owls, Ravens and Magpies	5
	F. Other Birds	6
	H. Reptiles	6
	I. Disease	6
		Ü
III.	Refuge Development and Maintenance	6
	A. Physical Development	. 6
	B. Plantings	7
	C. Collections and Receipts	7
	D. Control of Vegetation	7
	E. Planned Burning	7
	r. rrrez	(
IV.	Resource Management	7
	A. Grazing	7
	B. Haying	8
	C. Fur Harvest	8
V.	Field Investigations or Applied Research	8
	A. Progress Report	8
VI.	Public Relations	8
V 20 0	A. Recreational Uses	8
	B. Refuge Visitors	8
	C. Refuge Participation	8
	D. Hunting	8
	E. Violations	9
	F. SAFETY	9
VII.	Other Items	0
ATTO	A. Items of Interest.	9
	B. Report Credits	9
	C. Signature	10

NINEPIPE AND PABLO NATIONAL WILDLIFE REFUGES

Narrative Report

January 1, 1969 to December 31, 1969

I. GENERAL

A. Weather Conditions

Severe winter weather had both reservoirs completely frozen until late March. Spring weather was generally cool and wet and the summer and fall were dry.

Low fall water levels led to early freeze up on both reservoirs.

B. Habitat Conditions

1. Water

a. Ninepipe

The year started with the reservoir at 3008.9 feet which is 8.2 feet above the seven year mean elevation for January. Ninepipe was ice-free by April 10. Levels continued above normal until September when the elevation had dropped to 2996.1 feet (353 surface acres). The usual fall increase in water level did not materialize due to dry conditions and complete drainage of the upper storage reservoirs.

With the very low fall water level, it is almost certain that goose nesting will be affected next spring either by flooding of ill-placed nests or by discouraging some nesters entirely. There is no possibility the reservoir will be filled before April and most geese will have established territories prior to that time. Ducks are expected to be affected to a lesser degree, but low water conditions during migration may discourage potential nesting pairs from stopping on the refuge.

Ninepipe Pool Elevations - 1969

Month	7 year mean	CY 1969	Deviation
Jan.	3000.7	3008.9	plus 8.2
Feb.	3000.9	3008.9	11 8.0
Mar.	3002.2	3009.8	11 7.6
Apr.	3004.7	3009.9	11 5.2
May	3006.3	3009.9	" 3.6
June	3008.1	3011.0	" 2.9
July	3004.9	3007.5	11 2.6
Aug.	2996.8	3000.2	11 3.4
Sept.	2997.4	2996.1	minus 1.3
Oct.	3001.1	2996.2	11 4.9
Nov.	3001.4	2996.1	¹¹ 5.3
Dec.	3001.8	2996.1	11 5.7

b. Pablo

Pablo reservoir was 14.4 feet above normal at 3206.5 feet in January, and continued above normal elevation until August. By September the reservoir had been drained completely to facilitate work on the outlet structure. Because of repairs to the structure, the reservoir remained empty through December. The effect on waterfowl nesting is expected to be the same as at Ninepipe, although to a lesser degree because of less desirable habitat and a history of fewer nesting birds.

Pablo Pool Elevations - 1969

Month	9 year mean	CY 1969	Deviation
Jan.	3192.1	3206.5	plus 14.4
Feb.	3192.3	3206.3	114.0
Mar.	3192.4	3205.7	" 13.3
Apr.	3198.9	3208.3	9.4
May	3204.1	3207.5	11 3.4
June	3207.0	3209.3	: 2.3
July	3203.7	3205.5	1. 1.8
Aug.	3193.9	3187.4	minus 6.5
Sept.	3188.2	3179.0 (dry)	9.2
Oct.	3190.9	3179.0	" 11.9
Nov.	3191.3	3179.0	" 12.3
Dec.	3191.5	3179.0	11 12.5

2. Food and Cover

a. Ninepipe

Spring cover conditions were excellent and, combined with unusually high stable water levels, should have been exceptionally attractive to nesting waterfowl. Goose nesting was good, but the number of duck pairs using the refuge was unexplainably low for the quality of the babitat.

Aquatic plant production was very good this year due to the high water level through the spring and early summer.

Upland grass cover suffered this summer, particularly in Unit 2, from heavy cattle use. This was due to high water concentrating the animals in a narrow band of upland between the boundary and shoreline. It was apparent the number of A.U.M.'s allowed at Ninepipe had been based on much too large an acreage. (See Section IV).

Low water levels in late summer and fall produced many acres of goose browse on exposed mud flats, and tended to hold birds on the refuge through much of the hunting season.

b. Pablo

Upland cover conditions at Pablo were good throughout the year. Several old tree plantations along the north shore were fenced to provide protection from grazing. These areas should provide excellent nesting and winter cover for upland birds.

Drainage of the reservoir provided ample goose browse on exposed mud flats, but discouraged duck use almost entirely.

Geese tended to remain on the dry lake bed most of the fall with only occasional off-refuge flights.

II. WILDLIFE

A. Migratory Birds 1. Waterfowl

a. Ninepipe

Whistling swans made little use of the refuge this year, although several hundred birds were noted in the Charlo-Ronan area in April.

Canada geese arrived the week of March 23-29 and increased to 138 birds by the end of May. At least 18 broods, totaling 110 young, were produced this spring. Most birds chose to nest on existing earthen islands, although a few pairs made use of tree platforms and straw bales placed on some of the lower islands that were threatened by rising water.

Geese peaked at 815 in early November. As mentioned earlier, low water levels and resulting browse production on the mud flats were ideal for the geese this fall. Birds grazed tantalizingly before hunters as they hunkered along the boundary fences.

Snow geese arrived April 6 and remained but a few days. Two Ross' geese were noted with a small group of Snows during the following week. The white geese did not use the refuge during the fall migration.

Mallards were present all winter, but did not appear on the refuge until the first open water was available the week of March 16-22. Spring duck peak was a meager 5,085 birds, a majority of which were Pintails, Scaup and Redheads.

A breeding pair count was conducted May 27. The entire shoreline was covered on horseback and habitat conditions appeared excellent; however only 174 pairs were tallied. (See table below.)

Ninepipe Breeding Pair Count - 1969

Species	Pairs	Lone Males	Lone Females
Mallard	11	16	12
Gadwall	5		
Widgeon	2	5	

Species	Pairs		Lone Males	Lone Females
Pintail	1			
B.W. teal	6		13	
Cinnamon teal	3		13	
Shoveler	5		10	
Wood duck				1
Redhead	32		25	
Ringneck	1			
Canvasback			2	
Scaup	3		3	
Ruddy	12		6	1
TOTALS: Total breeding	81 g p airs - <u>17</u>	4	93	14

A total of 49 broods were counted during the summer months and production was estimated at 576 ducks.

The fall duck flight was disappointingly small this year. A peak of 15,000 birds came in mid-December. Numbers remained nearly static from October through late December, possibly due to low water conditions. No major migration was noted any time this fall.

b. Pablo

As at Ninepipe, Whistling swans made little use of the refuge, with one small group of birds observed both spring and fall for a period of about one week.

One pair of Canada geese was noted the first week in April. This pair was observed for approximately three weeks and then was not seen again until late June. At that time 80 birds, including three broods, appeared on the reservoir. In early August the flock had increased to 145 and by the first of September there were 625 geese using the refuge. Numbers continued to increase until mid-October, when a peak of 1370 birds was reached. Numbers fluctuated only slightly until late November and then dropped sharply until all birds had left by mid-December.

Mallards were first observed on the refuge the first week in April and the spring duck peak of 385 birds was reached two weeks later. Numbers remained low through the summer. O'ly four broods were actually seen, and duck production was estimated at 228.

A small influx of Mallards and Pintails the last week in August produced a fall peak of 6965 birds. Drainage of the reservoir in September left little attractive habitat for ducks and numbers dwindled through the fall.

2. Marsh and Water Birds

Large numbers of Red-necked and Western grebes nested at Ninepipe with lesser numbers present at Pablo. Low water provided extensive shorebird habitat on both refuges during the fall migration period and most of the common species were observed. Coot production was estimated at 630 for Ninepipe and 42 for Pablo.

B. Upland Game Birds

Ring-necked pheasants suffered some losses during the severe winter weather, principaly from road-kills, when birds were forced to the highways by deep snows. Production appeared good on both refuges, and numbers were augmented by releases of game farm birds prior to the hunting season. Numbers at the end of the year were about the same as in past years with 175 at Ninepipe and 200 at Pablo.

Gray partridge were not observed on either refuge this year, although they were seen near both areas.

C. Big Game Animals

None observed.

D. Fur Animals, Predators, Rodents and Other Mammals

Striped skunks were relatively abundant this year, judging from the number of road kills in the Ninepipe area.

Mouse populations were generally high on both refuges.

Muskrats were numerous through the high-water portion of the year, but none were seen after the reservoirs reached their low points in September.

E. Hawks, Eagles, Owls, Ravens and Magpies

Past observations that raptor use on these refuges is declining seem to apply this year as well.

Eagles did not winter on either refuge this year, due to the absence of waterfowl. The first Bald eagle was noted March 21 and the spring peak was only two birds. Fall use by these birds was also low. The first Bald eagles of the fall were observed November 19 and included one adult and three immature birds. Golden Eagles were not seen on either refuge until the fall period. A maximum of five were observed at Ninepipe and no more than two were ever noted at Pablo.

Few hawks or other birds in this category were recorded on either refuge. There was a small amount of Crow production at Nine-pipeand a moderate number of nesting Magpies on both refuges.

F. Other birds

New seasonal occurrence records for the Audubon's Warbler and the Yellowthroat were established at both refuges when they were observed September 5 and 8.

G. Fish

Bass fishing was only fair at Ninepipe this summer. The fish would just be getting into the shallows when a rain would cool the water and send them deep again. Heavy aquatic growth made angling difficult, but a few in the three to five pound class were taken.

Rainbow trout fishing was good at Pablo much of the summer and fish were running large. The Bureau's Division of Fishery Services stocked 30,000 three inch Rainbows in Pablo and the State introduced 6,105 small Rainbows (6.3 fish per pound).

Of course, drainage of Pablo reservoir caused the usual loss of fish and the usual public concern. The refuge worked with Fisheries Services and the Flathead tribe in salvaging and transplanting as many fish as possible.

H. Reptiles

Nothing to report.

I. Disease

One sick Great blue heron was picked up at Ninepipe and sent to Bear River for disease analysis. They were unable to determine the cause of death.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Ninepipe

The three quarter mile perimeter fence around Ninepipe headquarters was completely rebuilt. New construction consisted of a four wire stock type fence using "T" type steel posts.

2. Pablo

Two cattle guards were replaced at the Pablo refuge. These are located at the south and middle entrance roads.

The south, east and north sides of the Pablo boundary fence were re-posted. This was accomplished along with routine fence checks.

A total of 85 rods of fence was constructed on the north side of Pablo to separate several tree plantations from the grazing units.

The small picnic area at Ninepipe was maintained as required. This included hauling wood, garbage and mowing the grass.

B. Plantings

None.

C. Collections and Receipts

None.

D. Control of Vegetation

1. Biological Control

None.

2. Chemical Control

a. Ninepipe

A total of 12 acres of Canada thistle was sprayed with 2,4-D amine at two pounds acid equivalent, per acre. The treated area consisted of the main dike and the headquarters area. Initial results appeared quite good with resulting kills ranging from 80% to 95%.

E. Planned Burning

None.

F. Fires

None.

IV. RESOURCE MANAGEMENT

A. Grazing

1. Ninepipe

There was evidence of over use on the Ninepipe grazing allotment, particularly in Unit 2, along the northeast shore. The refuge called in B.I.A. and S.C.S. range personnel and conducted a re-survey of all grazing units this fall. Grasses present are no longer native, but more like tame pasture and the S.C.S. suggested a rate of .3 A.U.M.'s per acre. The problem evolved from the use of an acreage figure which was much larger than the actual upland acreage present. New acreages were computed, from recent aerial photos, for each grazing unit and A.U.M.'s were adjusted accordingly. B.I.A. issued the 1970 permit for 90 A.U.M.'s in accordance with the survey findings.

	Ninepipe Grazing Allo	otment	
Unit	Location	Acres	A.U.M.'s
1	West of main dike	91.5	30.5
2 3	North shore East of Hiway 93	55.5 23.7	18.5
4	South Shore	99.6	33.2
TOTALS:		270.3	90.1

Although close grazing does produce a certain amount of goose browse, it was felt that additional nesting cover was more urgently needed.

2. Pablo

The permittee at Pablo grazed 85 head of cattle from May 17 to September 14. No grazing problems were evident at this refuge and upland cover going into the winter was good.

B. Haying

None.

C. Fur Harvest

There was little trapping activity on the reservation during the winter of 1968-69 and no concrete figures are available on the catch.

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Progress Reports

1. Wildlife Inventory

Census on both refuges were done in accordance with the approved Wildlife Inventory Plan.

2. Waterfowl Banding

Banding details were covered in the Bison Range report.

VI. PUBLIC RELATIONS

A. Recreational Uses

Visitor use for Ninepipe and Pablo was estimated at 6700 actual visits this year with fishing the most popular activity at both refuges.

B. Refuge Visitors

Included in Bison Range report.

C. Refuge Participation

Included in Bison Range report.

D. Hunting

Goose hunting on the State Waterfowl Management Area and near Pablo was generally good opening week-end but slow through the remainder of the season. The State closed the goose season in this

portion of Western Montana on December 10, when the known kill exceeded 400. This is an annual measure taken to prevent an over-harvest of local birds.

Duck hunting was very poor around Pablo and, at times, quite good on State lands surrounding Ninepipe. Weather was generally too nice for good hunting.

Pheasant hunting was considered fair to good.

E. Violations

Manager Kaschke apprehended Richard A. Dill, Dayton, Ohio and Richard L. Dill, Stevensville, Montana for fishing during the closed season at Ninepipe. The cases were turned over to State Warden Lambeth. Both men forfeited bonds of \$27.50.

F. SAFETY

Included in Bison Range report.

VII. OTHER ITEMS

A. Items of Interest

The Ninepipe headquarters complex was taken over by the Division of Wildlife Services in July. Frank Wetherbee, District Supervisor for western Montana, moved his family into the house and operates his office and warehouse in the service building.

B. Report Credits

Section III, Foreman May. All other sections, Assistant Barber Typing, Clerk Scammon 3-175(Form NR-1 (Rev. March 1953)

WATERFOWL

	:		Wastra	0.5	(2)	1				
(1) Species	12/29-1/4	1/5-1/11	1/12-1/18	1/19-1/25	1/26-2/1	2/2-2/8	2/9-2/15	2/16-2/22	2/23-3/1	3/2-3/
ns:		1	1	1			1		T T	T
histling		-		-						-
rumpeter										
se:	1									
anada										
ackling		+-+	_							-
rant nite-fronted	-	11		-						-
now		1///-	1	-	- 12		-	-	-	-
lue		+ //		-		-	+	-	+	+
ther			1				-	+	+	+
cs:			4/2	-	-			1	-	-
allard			14							1
lack		1	-	1				-	-	-
adwall				A						
aldpate					//				1	1
intail					VYD.					
reen-winged teal					11/2	A A				
lue-winged teal			1		-	H				
innamon teal						1	2			
hoveler							A CA			
ood							Us.			
edhead							1	A .		
ing-necked								11		
anvasback										
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		1		1						

3 -7 'OB

Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Ringuipo MIR						MO	NTHS OF _	January	TO April	1,	19.69
			of	repor	rting			*L/27-5/3		: Produ	4)
Swans: Whistling Trumpeter	, Y (mmery of	data re	orded un	or (3),	10			70		
Geese: Canada Cackling	pte pte	eding are	12	12	522	64	64	64	1,876	Og or	30
Brant White-fronted Snow	44		A bobay		230	13			\$1.47.051		
Other Total Geose Ducks:	- 201	estat or	12	12	282	79	64	64	3, 59)		
Mallard Black Gadwall	***	110	35	110	380	300	100	50	7,595	4	
Baldpate Pintail	1.0	9898 b4 99)(0) @@	40 75	1,550	815	250 50	25	18,830	2 190	
Green-winged teal Blue-winged teal Cinnamon teal	neusuu	LUNG (6**		33 49 200	mo	205	125	10 15 15	3,360 105 105		
Shoveler Wood Redhead				1(0)	255	15.0	80	20	3,465		
Ring-necked Canvasback	. Y3			20	205 20 250	110	169 10 50	10	8,199 350 3,465		
Scaup Goldeneye Bufflehead	3.0			50	1.380	355 50	30 30	80 15	14, 260 1, 750 350		
Ruddy Other Merganser		220	100	255	A(0) 1180	275	150	25	3,150	61 100	
Total Ducks Coot:	: 200)	110	135	355 100	5,035 2,375	2,745	1,245	335	70,525 65,275		
			12 5 6	(07	ver)					1	1

(5) Total Days Use	(6) (7) : Peak Number : Total Production	SUMMARY
Swans 70	10	Principal feeding areas State-omed ampigultural lands
Geese 3,591	262	Immediately adjacent to the reservoir.
Ducks 70,525	5,085	Principal nesting areas
Coots 65,275	4,770	30 30 30 30 300
Cinnamon teal Shoveler Wood Redhead	10	Reported by Robert L. Barber
(1) Species:	In addition to the birds listed	n 7534, Wildlife Refuges Field Manual) d on form, other species occurring on refuge during the ed in appropriate spaces. Special attention should be given national significance.
(2) Weeks of Reporting Period:	Estimated average refuge popula	
(3) Estimated Waterfow Days Use:		umber of days present for each species.
4) Production:	breeding areas. Brood counts s	uced based on observations and actual counts on representative should be made on two or more areas aggregating 10% of the aving no basis in fact should be omitted.
5) Total Days Use:	A summary of data recorded unde	er (3).
6) Peak Number:	Maximum number of waterfowl pre	esent on refuge during any census of reporting period.
(7) Total Production:	A summary of data recorded unde	

Interior Duplicating Section, Washington, D. C.
1953

HONTHS OF

3-175(Form NR-1 (Rev. March 1953)

WATERFOWL

	:		Weeks	of r	(2)	ing p			11 1	
	5/4 - 10	5/112-1				6/8 - 17	6/15 - 2	6/22 - 28	6/29 - 7/	5 7/6 -
wans: Whistling										
Trumpeter	-At-					1 1 1 1			100	
ese:		11	300	200	300	700	200	200	200	300
Canada	64	64	133	138	138	138	138	138	138	120
Cackling		1			Charles and		E ROSELLIA		11/2 (1/2)	10.2
Brant	-					-			100	1
White-fronted Snow		-						2000		
Blue			-	-		-				
Depart Total Good	64	64	133	138	138	138	138	138	138	123
icks:	04	94	1333	130	100	150	130			41
Mallard	50	50	20	75	75	75	75	75	75	195
Black		30	20		1	-				105
Gadwall	15	15	5	10	10	10	10	10	10	
Baldpate	25	25	5	10	10	10	10	10	10	80
Pintail	20	20	10	5	5	5	5	5	5	35
Green-winged teal	10	10	5							10
Blue-winged teal	15	15	15	25	25	25	25	25	25	100
Cinnamon teal	15	15	10	20	20	20	20	20	20	
Shoveler	25	25	5	20	20	20	20	20	20	45
Wood	BOX STREET									10
Redhead	75	75	20	90	90	90	90	90	90	105
Ring-necked	10	10		5	5	5	5	5	5	5
Canvasback	15	15		10	10	. 10	10	10	10	10
Scaup	90	90	5	10	10	10	10	10	10	20
Goldeneye	15	15						The state of the s		
Bufflehead	5	5	10000000	5 - 10 THE W						
Ruddy	25	25	10	1.0	0.1	40	10	40	1.0	20
Other										
Rotal Ducks	410	410	110	320	320	320	320	320	320	635
ot:	335	335	245	300	300	300	300	300	300	450

3 -1 0a Cont. nR-1 (Rev. March 1953)

WATERFOWL (Continuation Sheet)

(1)	V	leek	s of	repor	ting				(3) Estimated waterfowl	: (4 : Produc :Broods:	
Species	11 :	12	13	71	15	16	3 8/24-30	: 18 :	days use	: seen :	total
Swans:		marria di	dece id	exaco no	man ENY	EALT					
Whistling					200					1000	
Trumpeter	- 1 - 1	Maria San			10 and 10 6 are	Design of	1 900 4 900				
eese:	123	123	285	285	285	360	360	CLU SLOS	21,231	18	110
Canada						101 VIII UII		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			
Cackling							-				
Brant	4.75	Com v man or	the facility	20/10/20 3	Carried States	UBAU AN	THE PERSON	NEED WATER			
White-fronted	876.1	105									Total Carrier
Snow				1 12 15 15 15 15 15 15 15 15 15 15 15 15 15			+				
Blue	123	123	285	285	285	360	360	19.00	21,231	18	130
Ducks:	143	11.59	20)	20)	207	300	700			200	
Mallard	195	195	400	400	400	1140	1350	-5-120	33,915	15	90
Black	7.73	199	800	200	400	Line	13,00		22,742		100
Gadwall	1,001	ESTUE D	10	10	10	10	a strategy av	49,2802 83	945	2	18
Baldpate	80	80	15	15	15	60	30	COMMONWE.	3,430		24
Pintail	35	35	15		45	950	64.5	100000	13 / 105	3	18
Green-winged teal	10	10	Post of the last	SITE STREET	SI ALCOHOL:	No retribude	a goldaniya y	EGISH NEW	385	and the same that	
Blue-winged teal	100	100	145	145	145	250	170		9,450	9	54
Cinnamon teal								1000	1 120		48
Shoveler	4.5	1.5	10	10	10	10	15		2.555	2	1.8
Wood	10	10	15	15	15	15	75	2011/07/2012	735	2	12
Redhead	105	105_	265	265	265	180	QK	The state of the	14.665	12	17/
Ring-necked	5	5							L55		
Canvasback	10	10	10	5	5				945		Mary 4
Scaup	20	20	10	10	10	(pal nes	CAR STA		2,315		18
Goldeneye					Property Comments		and the state of	1、 整	210		
Bufflehead			BATTER EX						70		
Ruddy	20	20	85	85	85	20_	20_		4.585	9	54_
Other		Territoria de la companya della companya della companya de la companya della comp	A Part of	The second second	1,3,700	Ther Iss	G 1792 . 93.0 S				
Total Ducks	635	635	1005	1005	1005	2635	2340		89,215	49	576
Coot: (2)	450	450	750	750	750	1500	2630		73.114		
15/		-			er)					- top over all of the same	

Cooks	(5) Total Days Us	e :	(6) Peak Numb	er :	(7) Total Production	SUMMARY
Swans		_ :	0	_ :		Principal feeding areas
Geese		. :	360	_ :	110	_memoraling_posinisted de
Ducks	89,215	:	2.635	_ :	576	Principal nesting areas Talanca and chareline around
Coots	73.115	. :	2,630	_ :	63.0	_eouth shops
	namon teal valer		30 3		28 38 28 10	Reported by
	Species:	INST				n 7534, Wildlife Refuges Field Manual)
1000	- Freeze					
Bla	lard ck					ed in appropriate spaces. Special attention should be given national significance.
	Weeks of Reporting Period	:	to those	spe		national significance.
(3)	Leading To the second s		to those Estimate	spe	cies of local and r	national significance.
(3)	Reporting Period Estimated Waterf		Estimate Average Estimate breeding	spe d av	cies of local and reerage refuge populations x number of young products. Brood counts as	national significance. ations. umber of days present for each species.
(3)	Reporting Period Estimated Waterf Days Use:		Estimate Average Estimate breeding breeding	spe d av	cies of local and reerage refuge populations x number of young products. Brood counts as	ations. amber of days present for each species. aced based on observations and actual counts on representative should be made on two or more areas aggregating 10% of the aving no basis in fact should be omitted.
(3) (4)	Reporting Period Estimated Waterf Days Use: Production:		Estimate Average Estimate breeding breeding	spe d av week d nu are hab	cies of local and recrage refuge populations x number of young products. Brood counts a itat. Estimates had at a recorded under	ations. amber of days present for each species. aced based on observations and actual counts on representative should be made on two or more areas aggregating 10% of the aving no basis in fact should be omitted.

REPUGE MAN

3-175(Form NR-1 (Rev. March 1953)

WATERFOWL

					(2)					
			Weeks	of r		ing	eriod			
(1) Species	8/31-9/6 : 1		9/14-20	9/21-27	9/28-10/4				:10/26-11/	1 11/2-8
wans:			71 / 77 -	1				2784	Aeriel	10.00
Whistling Trumpeter										
eese:				rg or it had a			1	ins/to		
Canada	380	214	214	218	214	215	460	160	460	1 46
Cackling										
Brant										
White-fronted										
Snow										
Blue	~									
PAPAT TOTAL GEESE	380	214	214	214	214	204	b60	250	160	16
ucks:						A CONTRACTOR			a la	
Mallard	1,270	11370	1,370	1,370	1,370	5,000	11,615	11,645	11,645	11,64
Black	4.5									
Gadwall	10	5		- 5		5		40.5	40-	100
Baldpate Pintail	40	100	40	10	10	100	496	685	685	68
	250	250	250	250	250	hos	485	685	685	68
Green-winged teal Blue-winged teal	0.7		-1.4	450	NAME	145	250	200	200	20
Cinnamon teal	96	135	125	145		11/5				
Shoveler	1.7	-				4-1				
Mood	15	10	5	10	10	10	200	200	200	26
Redhead	60	20	40	100	10	40	100	100	100	10
Ring-necked	0.0					1	1 200	400	300	
Canvasback	5	 		12.00			50	50	50	5
Scaup	-						100	100	100	10
Goldeneye			4,74			I I I I I I I I I I I I I I I I I I I	25	25	85	2
Bufflehead						100	28	25	25	
Ruddy	30	10	10	10	10	10				
Other Merganser			- 4	4				144234	19	1-1-1
TOTAL DUCKBE	1,975	1,580	1,880	1,800	1,880	6,020	13,715	19,715	13,715	13,71
oot:	3,100	1,200	1,200	1,200	1,200	1,200	1,200	1,200	800	80

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

7) Total Froduction	1 V 2	maiserA o	gree Le	corded a	2)				(3)	: (1	
•		11/16-22 12	11/23-29 : 13	11/30-12	rting #12/7-13	12/11/20	12/21-27	12/28-1/3	Estimated waterfowl days use	: Production: Broods:	Estimate
Wans: Whistling Trumpeter	Å S	moustly o	1	corded w							
Geese:	815	815	210	210	210	17.6	n two dr.	ore areas	NO.075	IN OF A	79
Cackling	Est	mated n	oper of	onne pro	Resd hat	ig on op	EMASSES ON	and acti	aj Guldije ou	Ta 1727-6 88 19	ative.
Brant White-fronted Snow	OH) AV6	350 NOG	epa bobaj	stions x	number of	days my	sent for	each aper	106,		
Blue		81.5	210	210	210	175			bo.07.5		
Oucks: Mallard Black	10,210	10, 210	10-000	10.000	10,000	11,100	10,000	-	931,8ho		
Gadwall	rep	merus b	a Tod sho	uld be ac	ded in a	BLODE TEAC	abenes*	Special		on g po s	ASD
Baldpate	935	99.54	100	200	lan.	250	species	decurring	1 760	17 IN 1330	
Pintail	370	370	\$00	200	200	250			16,060	11.00	
Green-winged teal Blue-winged teal Cinnamon teal	0	ONS #0	lo lo		- 10		[eTHP0.8	Held May	1382		1.6
Shoveler									6.000		
Wood Redhead					Repor	red by		94 E. SW	17/8		
Ring-necked		3.103	-		100		-		1,620		
Canvasback	15	15	15	1.5	15		 		1-0/0		
Scaup		a Foldor	30.		1,3,700	rber nee	osie Sur	-	2.800		
Goldeneye	55	55	60	750	60	200	200		8.050		
Bufflehead		1979			40.160						
Ruddy	and Francisco										
Ather Sansor		90	50	50	(0)	(0)	cruk ar.os		2,895	THE BINLE	ment to 0
TOTAL DUCKS	11,800	11,900	11,015	11,015	11,015	15,000	10,200	20	1,065.680		
Coot:	150	150	50	90	50			SIBMARY	Oh 250		

3-1751 MIGRATORY BIRDS Form NR-1A (Nov. 1945) (other than waterfowl) Months of January to April 195 69 brs seved III Refuge Nines to ASR Mourning dove (1) (2) (3)(5) evob beggiw-efin(6) (4) Last Seen Species First Seen Peak Numbers Production Total Number Total Estimated Total # Common Name Number Date Number Date Number Date Colonies Nests Young Number Golden eagle I. Water and Marsh Birds: NWBI Duck iwo henroH Corner Leon 01/11 01/11 Still present 2 2 04/11 04/26 Rad-nacked Grebe 10 01/18 1 04/18 Rared Grebe Crow 01/11 26 01/26 Hestern Grebe . 96 04/11 01/26 Great Blue Beren urt L. Barber Reported by INSTRUCTIONS as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. the correct names In addition etc. II. Shorebirds. Gulls and Terns: bbs ed bluods | oited gn | froger e it gnitub on refuge curring I be give, to those species of local and National attent on shoul Relident Samo Lines mes cto C 04/04 250 01/26 Still Present significance MII DETER 01/25 Common Spice 04/36 100 California Gull 25 (8) 01/26 12 03/28 50 Ring-billed Gull 25 03/23 150 01/26 The first reluge record for the species for the reason concerned. 'irst Seen: The greatest number of the species present in a limited interval o eak Numbers The last reflee record for the species during the season concerned Est mated number of young produced based on observations and actual roduction Estimated total number of the s(revo) using the refuge during the period concerned.

(1)	(2)	20(3	RATORY I	(4			(5)		(6)
Doves and Pigeons:	Aprell	<i>j</i>	orfowl)	than wat Months	(other			ge Hine	Refi	lev. 1945
Mourning dove										
White-winged dove (3)			4)		(0)		(3)		(1)	
otal # Total Estima		пээс	Last		Peak Nu		First		pecies	
Predaceous Birds:		Date	Number	Date	radmuN	Date	TadmuM		емеИ пош	62
Golden eagle						0.7.254	1-1000000		ORION HOME	00
Duck hawk								Birds:	darsh bar	Telser
Horned owl		Assessed	do Efficial	05/11	8	11/30	A 2 March			
Magpie		1	32	ACAAA	Of 1	EF-130		- 40	MINOR II	13000V
Raven			- 19	81,70		81/10	100		nelesta	
Crow			10	08/26	36	117.00	100000		nderst un	Lessand
Bald Eagle	1	03/21	211	03/28	1	04/04		1 200	Bire Bon	New (D
		Year								
		552 45		1				1207		
							Rob	ert L. B	rber	
			1			Reported	d by	• • • • • • • • • • • • • • • • • • • •		
			INSTRU							

Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gavilformes to Ciconiiformes and Gruilformes)

II. Shorebirds, Gulls and Terns (Charadriiformes)

III. Doves and Pigeons (Columbiformes)

IV. <u>Predaceous Birds</u> (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751 Form NR-1A

MIGRATORY BIRDS

(Nov. 1945) (other than waterfowl) Refuge Nimepipe Months of to August 195 69 bas sayou (5) evob bearing-off (6) (1)(2) (3)(4) First Seen Species Peak Numbers Last Seen Production Total Number Total # Total Estimated Colonies' Common Name Number Date Number Date Number Date Nests Young Number I. Water and Marsh Birds: Duck Lawk Horned 05/01 Common Loon Previous Period 2 St111 Present Previous St111 Red-necked Grobe Period 140 08/01 Present Eared Grebe Provious Peried 05/01 St111 Procest 1 WOTD 120 Western Grebe Provious Perlod 220 08/01 52111 Present Edwindship Text 1 Pied-billed Grobe 05/05 120 08/01 St111 Present Great Blue Beren Peried 08/01 St111 Present 25 Pravious Black-crowned Night 05/05 1 05/05 1 05/05 Heron 1 INSTRUCTIONS O.U. Checklist, 1931 Edition, and list grows in A.O.U. A end al zeisegl, (1) Ignenes ! II. Shorebirds, Gulls and ng perio Terns: 08/01 Present Killdoor Previous Period 250 St111 100 Propert sonsolitight 36 08/06 100 Coumon Saipe 200 08/01 81111 5 05/20 07/07 Still Present 20 Spotted Sandpiper 50 03/06 08/26 Still Present Greater Tellowlege 30 Present 08/01 10 08/26 St111 Lesser Tellovless Avocat 06/15 6 08/26 St111 Precent Present at Janua 900 05/20 300 08/01-81111 100 Wilson's Phalarope California Call Provious Period 08/01 81111 Present - 50 150 175 Ring-billed Gell Previous Pariod 450 08/01 51111 Precent Jastasta Franklin's Gell 06/11 06/11 1 06/11 1 Forster's Tern one or reed 8:111 150 05/20 200 07/07 Present last tasi adT Black Tern 05/20 100 81111 Present 07/07 ad actual on observations ung produced base Estimated number of y

Estimated total number of the si(revo) using the refuge during the period concerned.

(1)	(2	2)	(3	RATORY E	DIM (4)	12 1 1 1	(5)	(6)
II. Doves and Pigeons:	Magazana.		(Iwo'll)	than wat Months	(other	*******		Refuge	Nov. 1945)
Mourning dove White-winged dove	2	05/05	50	08/01	St111	Present	(9)	(1)	
oduction Total	9		Last S		Peak Nur	пев	First S	seties	32
IV. Predaceous Birds:	Number '		Number	Date	Number	Date	radmuli	emaN non	
Golden eagle Duck hawk Horned owl Magpie Raven		Princet	81111 81111	_fu/50	2 250	Pertod	Provious	nd Marsh Birds: n Look nothed Cooks	
Crow Red-tailed Rawk March Hawk	1 6	05/20 06/20 05/10	30 2 8	07/07 08/ 08/26	11 11 11	11 11 11	Provious Provious S Provious	10	17250 17270 17271 17271
		50/50	£	- 50/20	2	60/50	1 4	depth becauses -	e il
						Reported	l by	ert L. Barber	

INSTRUCTIONS

(1) Species:

453-8

OCK

45

Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gavilformes to Ciconiiformes and Gruilformes)

- II. Shorebirds, Gulls and Terns (Charadriiformes)
- III. Doves and Pigeons (Columbiformes)
- IV. <u>Predaceous Birds</u> (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-175	51
Form	NR-1A
(Nov.	1945

Refuge Minepipe

MIGRATORY BIRDS
(other than waterfowl)
Months of

(1) Species	First	Soon	Peak Nu		,	4) Seen		(5) Productio	rob begate	(6) Total
Species	FIISt	Seen	reak Nu	Impers_	Last	Seell	Number	Total #	Total	Estimated
Common Name	Number	Date	Number	Date	Number	Date	Colonies		Young	Number
I. Water and Marsh Birds:		**. ::		TAXEE		1274 ± 2.4			egge	deblon Mood b
Common loon	Previous	period	3	9/8	3	9/8	S. 17	Jan Can	Imo .	
Red-necked grebe			30		30 25	10/4				Magphe Ravon
Eared grebe Western grebe		46161	75		10		has been		T	
Pled-billed grobe			10		10	9/8			had ber	23-165
Great blue heren	•	#E\S1 \$1\11	30	10/4	5	12/5			3 70	derest.
u. O.A ai gioig tell bas .c	by Sabars	Reported	0.0 Ched	ZHOIT the A.	DUNYZMI basol as	neman Ja	STTOO AND	seD	asioso	
I. Shorebirds, Gulls and Terns:	addition	eta. In	"massim	"Lluzasa"	en amet	Larequa	blorA	sino .		
Mildeer	Previous	period	100	9/8	2	12/5	B 18070	stol otta		
Common snipe			25		20	10/24	echasini	42/19		
Spotted sandpipes	olileban		10 75		10 75	9/8				
Greater yellowlegs Lesser tellowlegs	11-14-2	•	100		100					
Avocet	•		15		100					
Wilson's phalarepe California gull		100 to 222	100	9910098	10	10/4	lan tenil	eal		
Ring-billed gell	lo (Smal		50	٠	15		/astest	edT :s:	odnisi sta	
Porster's term			10		10	9/8				
	/ Decitoono	D HORASS	70	e asiabge	9110 - 911		greet feel	BAT	: ###X-1/a)	
Black tern										

	(1)	[2)	(3	3)	(4	4)		(5)	1	(6)
II.	Doves and Pigeons: Mourning dove White-winged dove	Previous	period	25	9/8	25	9/8		\$199.18.63	utaE	S (Chai Thos
	Predaceous Birds:	Number T		nedauš	Daza	redaut	Det et al.			enall has	man 1 - 14
	Golden eagle Duck hawk		11/19	1	11/19	1	12/5		- cabati	deast br	a lejeW I
	Horned owl Magpie Raven	1	9/8	1	9/8	1	9/8	a Buologs B		loon grobs	Courses Red-ares
	Crow Red-tailed hawk Marsh hawk	Provious	period	10	9/5	10	10/4	- 10		ewiong Day toll	
	Bald eagle		11/19		11/19	ě	12/5			Krind mot	i koreli
							Reported	by Rober	rt.L. Bar	ber	•••••

INSTRUCTIONS

(1) Species:

Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gavilformes to Ciconiiformes and Gruilformes)

II. Shorebirds, Gulls and Terns (Charadriiformes)

III. Doves and Pigeons (Columbiformes)

IV. <u>Predaceous Birds</u> (Falconiformes, Strigiformes and predaceous Passeriformes)

Argost a Moreagour

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1750b FORM NR-1B DEPARTMENT OF THE INTERIOR (Rev. Nov. 1957) FISH AND WILDLIFE SERVICE Form NR-1B

UNITED STATES

BUREAU OF SPORT FISHERIES AND WILDLIFE

spaces below the last WATERFOWL UTILIZATION OF REFUGE HABITAT

Reported by	Robert L. Barber	Title	Assistant R	efuge Manager	
(1) Area or Unit	(2) Habitat		(3)	(4) Breeding	(5)
Designation	Type Acreage		Use-days	Population	Production
	Crops	Ducks	2,439,745	354	576
Amorton To E	Upland 246	Geese	69,195	72	110
	Marsh 572	Swans	133	2:0	0
	Water 1,204	Coots	1,108,590	200	630
	Total 2.022	Total	3,617,663	626	1,316
alasma as d	Crops	Ducks	to account the control of the contro		
	Upland	Geese	ALE WOULDEL !	14(90)()	787.2003 (S
	Marsh	Swans		in the last test	
	Water	Coots		W W W	
a safath	Total	Total			
· vasmoqmaj e	Crops	Ducks	of each year		
	Upland	Geese	Si Tangan gitta	10000	
	Marsh	Swans	DE BUILDONS I	BOME -	
	Water	Coots		13:02	
deep marchi	Total	Total			
Baera red	Crops	Ducks	teday ent ni	bns	
	Upland	Geese	CO PERSONAL PROPERTY.	MARKET STATES	
	Marsh	Swans			
	Water	Coots			
ys sounds av	Total	Total			
asqui moi	Crops	Ducks	estuaries, i	bus	
	Upland	Geese			
	Marsh	Swans		(III)	
-41300 080H	Water	Coots	C. Daniel Harrison	(-2)	
**************************************	Total	Total			
_weighter	Crops	Ducks	days is comp	rs: Use-	3) Use-day
	Upland	Geese			
	Marsh	Swans			
	Water	Coots			ORCHEDURANIAN PRINCIPAL
dose to do.	Total	Total			
	Crops	Ducks	gory of bird	edas	
	Upland	Geese			
	Marsh	Swans			
	Water	Coots	CHECKED BY DATE OF THE PARTY OF		
	Total	Total			

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

(1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descrip-

tions.

- Crops include all cultivated croplands such as cereals (2) Habitat: and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding
 Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

Refuge Months of January to April , 1969

(1) Species	(2) Density	an at h	(3) Young Produce	d	(4) Sex Ratio	R	(5) emova	ls	(6) Total	(7) Remarks	
	Cover types, total acreage of habitat Bird		Number broods obs'v'd. Estimated	Total	Percentage	Hunting	For Restocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.	
	Grasslands, 246 A	eneral land, l ed in V	detailed re the g oulture	oe c scw grig grig	ypes should uch as to ob reverting a ndard type s re possible.	ods, Sta	roO, don awbra ate		75	humerous road-kills this winte due to deep snows forcing birds onto highways	
Gray partridge		e area d under	ve sampl	Lds	on represent reas should	ein	roo b	ns an	010000	Not seen this period	
sinu	tions and actual co	observa	uodn pe	Das	produced,	youn eed1	lo r	numbe nbati	Estimated in repress	(3) YOUNG PRODUCED:	
ta on	s, etc. Include da	heasant	urkey, 1	# 1	urily to will le.	prim ilab	lies 1 avs	n app	This column	(Δ) SEX RATIO:	
	the report period.	daring	bevomen	Ţ	each catego	ni r	edmun	Lato	Indicate t	(5) REMOVALS:	
ay n seasons.	ort period. This mefuge during certai	the report of the s	during ting int	ge (ra	sing the ref lus those mi	er v ds p	faun tìd đ	total sider	Estimated include re	tJATOT (ð)	
Also	covered in survey.				determine po					(7) REMARKS:	
								,			
			, be	usu	ad should be	Tevo	iod c	teq e	d to the	* Only columns appld	
1613					-						

Form |)2 (April 1946)

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1)	SPECIES:	Use correct common name.		(3) Young	(2) Density	(1) Species
queste	DENSITY: modni dnenidneq er yllsoliloeqa oldoubordni dail	Applies particularly to the hunts, etc.). Detailed dat numbers. Density to be exprinformation is to be prefact number of acres in each covinformation need not be rep	a may be ressed in ed by a ser type if	omitted for s acres per ani statement from Bound on the r	in removal programs pecies occurring in mal by cover types. the refuge manager efuge; once submitted	(public limited This as to the d, this
ozol e	Hererous read-led	of cover types. Cover type information but not so much swamp, upland hardwoods, regrass prairie, etc. Standa No. 7 should be used where	as to obverting a ord type s possible.	bscure the gen agriculture la symbols listed Figures sub	eral picture. Examp nd, bottomland hardw in Wildlife Managem mitted should be bas	les: spruce oods, short ent Series ed on actual
hols	Not seem this por	observations and counts on size of sample area or area				d used and
(3)	YOUNG PRODUCED:	Estimated number of young prin representative breeding		based upon ob	servations and actua	l counts
(4)	SEX RATIO:	This column applies primari other species if available.		ld turkey, phe	asants, etc. Include	e data on
(5)	REMOVALS:	Indicate total number in ea	ch catego	ory removed du	ring the report perio	od.
(6)	TOTAL:	Estimated total number using include resident birds plus				
(7)	REMARKS:	Indicate method used to det include other pertinent inf				ey. Also

^{*} Only columns applicable to the period covered should be used.

OF LAW CANALED

Refuge Minera

Months of May

to August

, 19 69

(1) Species	(2) Density		(3) Your Produc	ng ced	(4) Sex Ratio		(5) emova		(6) Total	(7) ge (1) Remarks
end end common Name	O	d family Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	ேமூ	For Restocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
g-necked pheasan		enough aneral land, b ad in W nbmitte a areas	the g ture ture list res s sampl	100	pes should on as to observing agard type sy e possible. In representation	ods, Star wher	coving the coving to the coving the coving to the coving the covin	pes. but and h rie, id be us an	grass prais	Not seen this period
zini	co fautos bas anoli	observa	uoda	beas					Estimated in represe	(3) YOUNG PRODUCED:
ia on	s, etc. Include da	Jnseser	key, p	tur			lies Cava	n app	This colum other spec	(4) SEX RATIO:
	the report period.	iuring	bevor	y re	each categos	ai :	edmud	Isto	d edealbol	(5) REMOVALS:
N n seasons.	ort period. This m singe during certai	the rep	ering ng int	ge d rati	rier the refu us those mig	er u	dmun rid s	sotal	Estimated include re	(6) TOTAL:
Also	covered in survey.	t area sally r	non an Decifi	ulat ot s	etermine pop nformation r	to c	used artin	ethod ner p	Indicate m	(7) REMARKS:
				used	ed bluods b	rievo	n bol	neq e	sable to th	* Only columns appli
1613								Hilling		

Refuge

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

1613

	(1)	SPECIES:	Use correct common name. (A) (E) (C)	(T)
	(2)	DENSITY:	Applies particularly to those species considered in removal programs (public	Species
"be	questa	Pertinent inform specifically re last introduction	hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to to number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the	he
	bola	Not seem this pe	of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: sp swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, so grass prairie, etc. Standard type symbols listed in Wildlife Management Ser No. 7 should be used where possible. Figures submitted should be based on a observations and counts on representative sample areas. Survey method used size of sample area or areas should be indicated under Remarks.	ed oruce hort ries octual
	(3)	YOUNG PRODUCED:	Estimated number of young produced, based upon observations and actual count in representative breeding habitat.	S
	(4)	SEX RATIO:	This column applies primarily to wild turkey, pheasants, etc. Include data other species if available.	on
	(5)	REMOVALS:	Indicate total number in each category removed during the report period.	
t.	(6)	TOTAL:	Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain s	easons.
	(7)	REMARKS:	Indicate method used to determine population and area covered in survey. Al include other pertinent information not specifically requested.	so

^{*} Only columns applicable to the period covered should be used.

OL DAND GR. DI.

Minepipe

Refuge

Months of September

to December

, 1969

(1) Species	rowd) man thord treadment it?		(3) Young Produced		(4) Sex Ratio	R	(5) emova	mmoo ls foots	(6) Tot a l	(7) Remarks	
the	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Restocking	For Research	Estimated number using Refuge	Pertinent inform specifically re List introductio	quested.
Ring-necked phonont phonont but be compared to the compared to	the second secon	neral pand, be and, be in Witten	the go ture l list res si	noul nbols Figure	th as to observe the constitution of the const	ds, Stan wher ts o	used	nd haie, die, die, de	No. 7 shoul	Nont. Fad release birds on State 1s the refuge	
sóm	ions and actual con	bserva	uodn	beag	produced, b	oung	ord s	tedmu titati	Estimated : in represen	YOUNG PRODUCED:	(3)
a on	, etc. Include da	easant	ey, pl	tur	rily to wild e.	rims Labl	ies p	appl es 1	This column other spec	SEX RATIO:	(4)
	he report period.	uring	bevo	r res	each categor	nž ·	edmu	tsl	Indicate t	REMOVALS:	(5)
V seasons.	ert period. This me fuge during certain	the rep	ring g int	ge du ratis	ing the refu us those mig	er us	dmun rid ,	otal iden	Estimated include rea	TOTAL:	(9)
Also	overed in survey.	area ally r	ns no	alati ot sg	etermine pop nformation n	b od E dm	used	thod er p	Indicate m	REMARKS:	(7)
				nsed.	ed bluode b	PTEV	io bo.	per	able to th	mly columns appli	*
1613											

Mabpipe

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

to December , 1969

(1)	SPECIES:	Use correct common name. (4) (8) (9) (1)
(2)	DENSITY:	Applies particularly to those species considered in removal programs (public
ation not quested.		hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area
	Ment. Fad release Mirds on State la the refuge Not observed	of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
(3)	YOUNG PRODUCED:	Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
(4)	SEX RATIO:	This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
(5)	REMOVALS:	Indicate total number in each category removed during the report period.
(6)	TOTAL:	Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
(7)	REMARKS:	Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

^{*} Only columns applicable to the period covered should be used.

3-175 Form NR-4 (June 1945)

SMALL MAM__LS

1945) RefugeNinepipe National Wildlife Refuge Year ending April 30, 1969

The second secon	(2) Density			(3) Ramovals				(4) Disposition of Furs					(5)	
it, stc. k of Worth ste Animals		quirrel. se are i	r in	el, f Gurre Lutte	nitipe ni ses	ay oq nameg Se u	is, i	Share Trapping		Refuge Shipped	ted		Total Popula-	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hun ting	Fur Harvest	Predator Control	For Re- stocking	For Re-	Permit Number	Trappers Share	Refuge share	Total Ref Firs Ship	Furs Dona	Murs Destroyed	tion
Meadow Mouse	Grassland 246A	enina r	e po	STOR	nt i	rease faced	120 6	d ty to t	Deni					Moderate
eer Mouse	the refuge; once subs	found or	уре	1 16 31 6	oo d	n eac need	ree i	er of ac	Emaris Entit					n
	d be detailed enough to obscure the general	as doum	08	not not	e bu	type matio	cover infor	lo seta betlasb	ens the					Low
iuskrat	Massey & Mates 1 6774	dwoods,	ha iri	land Sta	p, u eras	nawa. hort	pruce da. e	ples: s	Eza: lan:					50
Tigures sub- sentative Mail	used where possible.	ed blue			ries on	nt Se based	mega d be	life Mar	IN:					Unknown
ladger	Grassland 246A	nd else	he	ner bi	netin s.	rvey enark	. Si der i	de areas cated ur	man Ind					5**
easel and to OE	Marsh & Grassland 818	A soles a	ă9	inder	r red	ers I	tote	oate the	thal		:2:	LAYON	3) R	Moderate
Beaver	Water, Marsh & upland 2,000A	on the	nezi no	y te vale	mer a	cludi v any	r, ir o she	fous yes	eng.					Occasiona
Columbia Ground	Grassland 246A	dmya ili	rtag					rid-oradi		eve 40	HOIT	SPOS	a (u	Low
ocket Copher	ket, including fure to	doss h	1pp		peli to re		imun EsjoT	cate the						Low
Coyote	Predator Animal Hunter	. ded.	LOAL	bna g ma	fon, col		ged o		ean					2

any other pertinent information not specifically requested.

REMARKS: * No observations but one den is inhabited.

Reported by

INSTRUCTIONS

Year ending April 30, Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

Wilsisia Refuse

(1) SPECIES:

LatoT

Use correct common name. Example: Striped skunk, spotted skunk, shorttailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

DENSITY:

Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS:

极

Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR:

On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided. reduced a Fredator Animal Hunter

(5) TOTAL POPULATION:

Estimated total population of each species reported on as of April 30.

REMARKS:

Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service

Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

	Mineripe	P. (4)								
Cultivated	Perm Share		rnment's Si		Return rvested	Total		Green Manure, Cover and Water-		
Crops Grown		Bu./Tons	2 8 9	Bu./Tons	A Y	Bu./Tons	Acreage Planted	fowl Browsing Crops Type and Kind		Total Acreag
	or seme amoner of the core	These crops and the pe These crops and the so od Grantes Crops - Spe so	Finding branch prespect to	rical product of a by a contract of a contra	• Al				receipts are, Renan, Mon	
	ed Th ell pe teb	TradaW .qoro .k egoro	Report	HILL YOU	posedor.	un edd y hLvoda 4 e7 % e4 e7 when	a de Li - oquer oqis otos iq ro r 507 boo	Fallow	Ag. Land	100 mm
o. of Permittees:	Agricultur	al Operation	ons	(ane	Haying	Operations	_Mone_	Ma s	Ag. Land	
o. of Permittees: Hay - Improved (Specify Kind)	Agricultur Tons Harvested	al Operation	Cash Reven		Haying GRAZING	Num	ber mals	Ma s		ACREAGE
Hay - Improved	Tons		Cash	iue (Num Ani	ber	Grazin	ng Operations	
Hay - Improved	Tons		Cash	iue 1.	RAZING	Num Ani	ber mals	Grazin AUM'S	ng Operations	ACREAGE
Hay - Improved	Tons		Cash	1. 2.	GRAZING Cattle Other	Num Ani	ber mals	Grazin AUM'S	Cash Revenue	ACREAGE

DIRECTIONS FOR PREPARING FORM NR-8 CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. <u>Unharvested</u> - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under <u>Bushels Unharvested</u> column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under <u>Cultivated Crops</u>, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

REFUGE GRAIN REPORT

	(1)	(2) On Hand	(3) Received	(4)		Grain D	(5) ISPOSED OF		(6) ON HAND END OF PERIOD	through		
	VARIETY*	BEGINNING OF PERIOD	During Period	TOTAL	Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
			7.775		1 100 E O N		o ererie	1 7 7 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	actions in	14. 15 km 1	14377 6	e (ca.
Wheat		20	code tiere dien of grad	20	grain si es propos	apped in c	20	20	0	in on con		
Barle		1,130	Sho	1,670		a Rightin's	770	770	900		900	
		(7) This si (8) Nes	is a propertion	sed break-d seding new	crobs			in column	6. Indicate	if grain is		
		(4) A b (8) Col	non painn	food patch ins 2 and 6.								
		(8) Rop	it not suit tier reluge ort all grai	en, ne sipedili	details r	re necessus de graine;	y in cons aquatic an	dering total dother seed as free	fer of seed will be listo ifer, share o	supplies to for NR-9. repping, or		
	基格 1 公司在1	(1) List h)	each type brid corn, do new ec	of grain sep rarnet when a compone, m	red May	d specifical wheat, dur beans, etc	F. as flint		dent corn, it, prose nulli	dance doub th coulding a soybeard		
•	, 100 EV	Report all in shall be by barley- rd-50 b	considered for the re-		to a best s 450 lbs.	el: Com (soy beans-	shelled)— -60 lb., n	50 Ja - 6000 10 Ja - 6000	(ear) 70 h cowpeas ft.) by 0.8 b	waithta of c; whent-o to to, and usticia.	2.04	

(8) Indicate shipping or collection points

(9) Grain is stored at Ninepipe head agency

(10) Remarks Barley received from Lectand H.V.R.

^{*}See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.

tong sh hoperancy than the tong his his his

- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

3-1979	(NR-12)
(9/63)	

Bureau of Sport Fisheries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

-	Refuge
	Winanina

Reporting Year Proposal Number

INSTRUCTIO	NS: Wildlife Refuges Ma	anual, secs. 3252d, 3394b	and 3395.				1969	
Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
7/15	Canada Thistle	Dike & Horse Pasture	12	2,4 - D Amine	6 pal.	2# Acid Equi	Vater	Ground Hand Spray

^{10.} Summary of results (continue on reverse side, if necessary)

Excellent kill, extent of long-range control is questionable

3-175(Form NR-1 (Rev. March 1953)

WATERFOWL

			Weeks	of r	(2)	+ 1 n a	period			
(1) :	1	: 2	: 3		: 5	: 6	:	:	: 9	: 10
wans: Whistling Trumpeter										
eese:					-	-				
Canada				The state of the s						
Cackling		//	1.							
Brant		11	1		1					
White-fronted		1	1	4	 		-			
Snow		-	1 1 6	1						
Blue				14-				1		
Other				1112		0				
ucks:				1	4			*		
Mallard					1					
Black						1×1 0	N			
Gadwall						N				
Baldpate							1-0			
Pintail							1 1			
Green-winged teal								0		
Blue-winged teal										
Cinnamon teal										
Shoveler										
Vood										
Redhead									-	
Ring-necked			1							
Canvasback			-							
Scaup		-			1		-			
Goldeneye										-
Bufflehead			1				-			
Ruddy										
Other										
		1	-			1	1	-		

3 -7 70a Cont. AR-1 (Rev. March 1953)

WATERFOWL (Continuation Sheet)

(1) : Species :	3/09-15	Week	sof	3/30mb/5	ting	1/13-19	14/20-26	1/27-5/3	(3) Estimated waterfowl days use	: (4 : Produc :Broods:) : seen :	tion Estimated
Wans: Whistling Trumpeter	A a	mmerà o	data re	sorded un	(3) °	7			49		
canada Cackling	DI4	eding ar	as, Bro	od counta	ano ga	2	or two or	nore area	988188 19 18	JOR OF 4	79 V**(=0
Brant White-fronted Snow	iden.j		yî, bohay	APPEND E	ompon o	gene is		ousy sho			
Blue	1 504			2	2	2			(19)		
ucks: Mallard		prope ch	0708 OZ	75	75	75	55	30	2,135	7	
Black Gadwall Baldpate		addition priting P	rded abo	ada list	3 (0.0))Ye ()	5 26	Spet Hall	165	wild he g	2.00
Pintail Green-winged teal	TNS#BIRE	LUMS (Se	Secs. 7	31 thron	P 38311	100	98	Mald Nam	1,610 .63 1,635		
Blue-winged teal Cinnamon teal				. #		2009		5	35		
Shoveler Wood					Beron	5.5	35	3.0	455		
Redhead Ring-necked						5	5		ES		
Canvasback Scaup		0.03			Prelan	15	110	- 5	210		
Goldeneye Bufflehead		9			7	12-6 T (5037)	<i>j</i>				
Ruddy Uther		1			Princ	he 5 Lee		10	75		18
coot: (5)	se : Peak	Number	Total P	75	175	385 250	1100	80 20 30	2,660		

(5) Total Days Use	(6) (7) Peak Number: Total Producti	on SUMMARY
Swans 49	7	Principal feeding areas Agricultural lands northwest of
eese 🚇 🐸	2	reservoir.
ucks 6,405	329	Principal nesting areas
oots 2,660	250	
Cinnamon teal Shoveler Wood		Reported by Robert L. Barber
Pintail		ough 7534, Wildlife Refuges Field Manual)
1) Species:		sted on form, other species occurring on refuge during the added in appropriate spaces. Special attention should be given nd national significance.
2) Weeks of Reporting Period:	Estimated average refuge po	pulations.
3) Estimated Waterfowl Days Use:		x number of days present for each species.
4) Production:	breeding areas. Brood coun	roduced based on observations and actual counts on representative ts should be made on two or more areas aggregating 10% of the shaving no basis in fact should be omitted.
5) Total Days Use:	A summary of data recorded	under (3).
6) Peak Number:	Maximum number of waterfowl	present on refuge during any census of reporting period.
7) Total Production:	A summary of data recorded	under (4). (3) Latinated : Production
		the first of the f

Interior Duplicating Section, Washington, D. C.
1953

REFUGE PUBLISHED

3-7-700

MONTHS OF SERVICE

3-175(Form NR-1 (Rev. March 1953)

WATERFOWL

					(2)		Hey		August	
			Weeks	of r		ing p	eriod			
(1)	5/4 - 10:	5/11 - 17				6/8 - 14		6/22 - 28	6/29 - 7	5 7/6
Species :	1 :	2 1	3	1 4	5	0		0	9	10
ns: nistling										
rumpeter										
se:										
anada							-			
ackling							80	80	80	ac
rant									81.2	1 1
nite-fronted										
now								-		-
lue									-	
MAN Total George							RO.	80	-	-
(5:				-			242.3			- 86
llard	30	30	60	60	60	60	60	60	40	
ack										- 00
dwall	5	5	5/	5	5	R	E			
ldpate	5	5	5	5	5	-	5	5	5	6
ntail	5	5	10	10	10	1(0)	10	10	10	10
reen-winged teal			- 5	5	5	5	5	5	5	- 5
lue-winged teal	2	5	15	15	15	15	15	15	15	15
innamon teal	5	5	10	10	10	10	10	10	10	10
noveler	1(0)	10	15	15	15	16	The state of the s	15	16	15
ood										
dhead			10	10	10	10	10	10	10	10
ng-necked			10	10	10	10	10	10	110	10
nvasback	5		111111111111111111111111111111111111111							
aup		3.0	15	15	15	15	15	15	15	15
ldeneye										
ifflehead			10	10	10	10	10	10	30	
ddy	10	10	5	30	10	10	10	15	16	15
her Red-breasted	30		20 7	20	30	10	20	10	10	10
Norge Total Ducks	80	80	185	185	185	185	185	185	185	185
	30	30	20	20	20	20	20	20	20	20

3 -1-0a Cont. MR-1 (Rev. March 1953)

WATERFOWL (Continuation Sheet)

REFUGE							ITHS OF				19. 69
		Weeks	0 f	repoi	2) rting 8/10-16	per 8/17-23	1 o d	D 18	: (3) : Estimated : waterfowl : days use		
Swans: Whistling Trumpeter	A 87	nmerh og	data red	orded un	er (3).						
Geese: Canada	80	£10	18. 374 oc	145	145	145	625	ore area ald be o	11,795	3	15
Cackling Brant White-fronted	YA61	age week	rk bobigs	Clons x	umber of	qwAs bu	esent for	each spe	ilea.		
Snow Blue											
Other Total Geose Ducks: Mallard	80	(30)	- WAS	12.5		145	625		24.050	1	90
Black Gadwall	60	(40)	220 2768 01	0 0(9	22.0	ه مدی	2,310	2000197	26.950	n q po s	400 6
Baldpate Pintail	10	10	0.000	30	30	30	190	comultur	21,510	dag the	18
Green-winged teal Blue-winged teal	THEMPICAL	35	2009 U	ST ANTION	10 (5.54°	30	AS	ield Mar	2,275	2	6 21
Cinnamon teal Shoveler	15 10 15	10	5		5	5	25		1,505	5	18
Wood Redhead	10	30	50	50	50	ed by	1,530		12,910		12
Ring-necked Canvasback	- 20	10	8	5	5	- 6	10		22(0)		
Scaup Goldeneye Bufflehead	25	- 15		6)40	LLTHO	ther nee	ELDE ATER		1,050	8.5 (2.33)	21
Ruddy Other	10	10	15	15	15	15	5		700 205 ALO		6
	185	185	395	395	395	395	6,965	SUMMAKI	73,885		223
Coot: Lotel Days U	20	20	50	50	50 rer)	50	14:0	SIDUALITY	6,510		12

Cook:	(5) Total Days Use	(6): Peak Number : To	(7)	90 30	SUMMARY	6,510	
Swans	0	0	0	Principal fee	ding areas Agos	lics in reserve	is at
Geese	11,795	625	15	and the state of	A STATE OF THE STA		
Ducks	73,885	6,965	228	Principal nes	ting areas Sout	and west short	, a) 8 (₁₇ (₁₈)
Coots	6,510	(Mo)	12	4	1 20 1 3	330	1
жедре жедре	pad	10 20	60 60	Reported by	Robert L. Berber		
Shove	Jer	70 - 30 -	2		26	5 8 5 2	
Malla Black Gadwa	ri.q	reporting perio		ed in appropriat	species occurring e spaces. Special cance.		
	eks of porting Period:	Estimated avera	ge refuge popula	ations.	(68	33,275	
3) Es	timated Waterfow						
Da	ys Use:	Average weekly	populations x nu	mber of days pr	esent for each spe	cies.	
4) Pr	oduction:	breeding areas.	Brood counts	should be made o	servations and act n two or more area n fact should be o	s aggregating	
5) To	tal Days Use:	A summary of da	ta recorded unde	or (3).	14		
6) Pe	ak Number:	Maximum number	of waterfowl pre	esent on refuge	during any census	of reporting p	eriod.
	147					The state of the s	1 1 7 00000 07 000

Interior Duplicating Section, Washington, D. C. 1953

(7) Total Production:

BELLOCE

A summary of data recorded under (4).

3-1750 Form NR-1 (Rev. March 1953)

WATERFOWL

	:				(2)					
			Week	s of	report	ting	period			
-1-07-0	N32-6/6	7/1- 23		WELTER					10/2 -11/1	11/2-8
Swans: Whistling									Restat	
Trumpeter										14.7
eese:										
Canada	250	2700	730	750	730	720	1,570	1.570	1,570	1.50
Cackling										
Brant										
White-fronted										
Snow										
Blue			-							
STANKY TOTAL GERGES	750	770	730	730	750	730	1,990	A.220	1.50	1,370
Oucks:	1,200	1_260	1.000	1,000	2,600	2.400	1,100	1-100	1,400	1,000
Black	Ascer-		1-45					4684	1	T. T.
Gadwall	-		+		+	-				
Baldpate	325	188	186	126	228	188	800	100	100	
Pintail	525	525	e,	536			200	200		3.00
Green-winged teal										
Blue-winged teal	115	33.6	13.6	33						
Cinnamon teal							~			
Shoveler	16	100	10	AS		48	18	26		
Wood							31	To the second		
Redhead	1,600	1,500	1.00	100	100					
Ring-necked										
Canvasback										
Scaup	5	- 5	6	5				114		
Goldeneye										
Bufflehead										
Ruddy	10	10	10		-	-				200
AFF Morganser	50	30		20	20	20	30	59		
TOTAL DUCKS:	3,825	3,000	3405	2,005	3,500	3,920	2,745	30665	1,690	1,690
Coot:	550	980	550	950	200	400				

. Cont. dR-1 (Rev. March 1953)

WATERFOWL (Continuation Sheet)

				7	,			ptember			19[6
				repor	ting			12/23-1/3	(3) Estimated waterfowl days use	: (4 : Produc :Broods: : seen :	tion Estimated
Swans: Whistling Trumpeter	A '81	marjust	data rec	orded und	er (3).				77_		
Geese: Canada Cackling	1.090	1,010		outhy prod d countries bimates h	nced base	d on obei made on basis in	vestions two or s	and actua ore areas	agg 6 230 on agg 4 200 agg	represent	#11.90 0
Brant White-fronted Snow Blue	M] VAGI	TEO AGE	A Donals	chons x n	30 dequa	days pre	SIE TOP	esch aped	98		
Ducks: Mallard Black	1,000 530	1,000	700 00		national	elemific	IDG8 *		89,950 113,820	1	
Gadwall (Baldpate Pintail Green-winged teal	MSTRUCT!		Sacs. 75 to the bi	31 throug rds lists ld bs add	n (534,) d on form ad in ap	Gldlifa 1 other Fopriete	eluges :	Leid Manna Dowrring o Special	3,9/4 20,700	10 10 100 (S	A910
Blue-winged teal Cinnamon teal Shoveler Wood					gebon	eq pk		garane a	2,590 Bb		
Redhead Ring-necked Canvasback									39,900		
Scaup Goldeneye Bufflehead Ruddy					LLTUC	DET DESK	De Ang		750		. 200
Otherwayerses	320	75 320	Total B	300 0400 000	21300	hay teed	nE eras	SOBIARY FINE,	9,576 198,030 17,500	on on one	

(5)	(6) (7)			17,4500
Total Days Use	: Peak Number : Total Produc	tion	SUMMARY	
Swans	430 430	Principal feeding are	as State and	private grain fields
Geese	_1,370_	y amenualize the ref	nen.	222
Ducks	9.005	Principal nesting are	as	8/0
Coots	100			
Wood Redhead		Reported by	Bahast Ja	
Cinnemon teal Shoveler				
	STRUCTIONS (See Secs. 7531 th	hrough 7534, Wildlife Refuges	Field Manual	matter .
(1) Species:	reporting period should be	listed on form, other species added in appropriate spaces and national significance.	. Special att	
(2) Weeks of	200			10.85%
Reporting Period:	Estimated average refuge	populations.		20,000
(3) Estimated Waterfow	1			
Days Use:	Average weekly populations	s x number of days present fo	r each species	3.
(4) Production:	breeding areas. Brood con	produced based on observatiounts should be made on two or tes having no basis in fact s	more areas ag	gregating 10% of the
(5) Total Days Use:	A summary of data recorded	d under (3).		3.5
(6) Peak Number:	Maximum number of waterfor	wl present on refuge during a	ny census of 1	retariford . Broader Ea
(7) Total Production:	A summary of data recorded	d under (4).		Satimated : Producti

Interior Duplicating Section, Washington, D. C.
1953

STPS 0

ATERFOW

3-1751 Form NR-1A MIGRATORY BIRDS (Nov. 1945) (other than waterfowl) Refuge Pable Ma ăp 1 Months of Mourning dove (1) (2)(3)(4)(5) evob begain estim(6) First Seen Species Peak Numbers Last Seen Production Total Number Total # Total Estimated Common Name Number Date Number Date Number Date Colonies Nests Young Number Golden eagle I. Water and Marsh Birds: Duck hawk Horned owl Comen Loon 01/11 01/11 01/26 1 Crow etalogue Ru Lu Sie Reported by INSTRUCTIONS Use the correct names as found in the A C.U. Chetklist, 1931 Edition, and list group in A.C.U. order. Avoid general terms as "seaguall II. Shorebirds, Gulls and In addition Terns: add algode loined ga Jiogen as during t on refuge form, other species occurring STORES OF LOCAL BUT STEEL becoulve EV/26 Course Suige 01 890 01/10 10 significance TS 2 Creater Telloudess California Call 30 2.0 River Sillies Oall season concerned. The first reluge record for the species for the o Isvietal betimil the species present in a The greatest number o eak Numbers: The last refige record for the species during the season concerned Estimated number of young produced based on observations and actual Estimated total number of the s(revo) using the refuge during the period concerned.

(1)	()	5)	20(3	RATORY IC)TM (4	1)		(5)		A1-9(6)
II. <u>Doves and Pigeons</u> : Mourning dove	Lipqi) J	rfowl)	than wate Months	(other		illit oli	lell eg	Ref	Vov. 1945
White-winged dove		leen	(4 Last	ared	Peak Nu	пее	(2 First		(I) Species	
IV. <u>Predaceous Birds</u> :		Date	лефшиИ	Date	Number	Date	TedmuN		шод Меже	(0)
Golden eagle Duck hawk Horned owl Magpie Raven Crow						1		:eb118	dereM bareh	Tater I
Forregiosus B. L. I	1	01/01	1	or/or	1	01/01				
								1		
	H									
						Reporte	d by	rt L. P.	rber	
(1) Species:	Use the cor order. Avo form, other priate spac significanc	id general species of species. Speci	s as found terms as occurring ial attent s: I. Wat II. Sho III. Dov	s "seagul on refug tion shou ter and M prebirds, yes and P	l", "tern' e during t ld be give arsh Birds Gulls and igeons (Co	ecklist, ', etc. the repor en to tho s (Gaviif d Terns (d by	on, and n to the d should of localiconiifo ormes)	list group birds list be added land Nat rmes and (p in A.O.N sted on in appro- ional Gruiiform
(1) Species:	order. Avo form, other priate space	id general species (es. Speci e. Groups	s as found terms as occurring ial attent s: I. Wat II. Sho IV. Pre	d in the s "seagul on refug tion shou ter and Morebirds, yes and Pedaceous	l", "tern' e during t ld be give arsh Birds Gulls and igeons (Co	ecklist, ', etc. the repor en to tho s (Gaviif d Terns (columbiform	d by	on, and n to the d should of localiconiifo ormes)	list group birds list be added l and Nat rmes and (p in A.O. sted on in appro ional Gruiiform
	order. Avo form, other priate spac significanc	id general species (es. Speci e. Groups efuge reco	s as found terms as occurring ial attent s: I. Wat II. Sho III. Dov IV. Pre	d in the s "seagul on refug tion shou ter and Morebirds, yes and Pedaceous In especies	l", "tern' e during to ld be give arsh Birds Gulls and igeons (Co Birds (Fal	ecklist, ', etc. the repor en to tho i (Gaviif i Terns (clumbiform season co	d by	on, and n to the d should of local iconiifo ormes) formes an Passe	list group birds list be added land Nat rmes and (p in A.O. sted on in appro ional Gruiiform
(2) First Seen:	order. Avo form, other priate spac significance	id general species (es. Speci e. Groups efuge reco t number (s as found terms as occurring ial attent s: I. Wat II. Dox IV. Pre ord for the	d in the s "seagul on refug tion shou ter and Morebirds, yes and Pedaceous !	l", "tern'e during to during to during to during to during to during the during to during the durin	ecklist, ', etc. the reporen to tho G (Gaviif d Terns (coniform season colimited	d by	on, and n to the d should of local iconiifo ormes) formes an Passo	list group birds list be added land Nat rmes and (p in A.O. sted on in appro- ional Gruiiform

Estimated total number of the species using the refuge during the period concerned.

(6) Total:

3-1751 Form NR-1A (Nov. 1945)

Refuge Poblo

MIGRATORY BIRDS

(other than waterfowl)

Months of

(4)

August 194 6

(1) Species	(2 First		(3 Peak Nu	•	,	4) Seen		(5) Production	1	(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimate Number
. Water and Marsh Birds:									eagle awk lowl	Golder Duck Horner
Red-necked Grobe	2	05/20	50	05/05	Still	Present			20	Magpi Raven
Horned Grebe Eared Grebe Western Grebe Plan-billed Grebe Great Blue Beron	13222	05/20 05/20 05/20 05/20 05/20	200 50 2 30	05/20 07/07 07/07 05/20 08/26	Still Still Still Still	05/20 - resent - resent - Present - Present			20	WOTO.
	adell yd	Reperted								
on, and list group in A.O.	131 Editi	f ,falfst	0.U. Che	TIONS in the A	INSTRUC	eeman to	the corre	esti	pecies:	(1)
. Shorebirds, Gulls and		e report	"term" during ti	"seagull n refuge	terms as	The same of the sa		ord form	1	
Sendyalmated Plover	siecies	03/01	Svin 18	03/01	Stan	Francis	te spaces	ling pri		
	Previous Previous	Period Period	30	08/01	San		ificance	sign	30	
Creater Tallenless	1 (0)	08/01	50 30	08/29	Still	Present				
Least Sandplper	igin A	08/01	1	08/01	Still	Present		No.		
Eondteher Western Sandploer	50	03/01	50	08/01	Sun	Present	Cirbt rei	: The	List Seen	(2)
California Gull	Previous	Period	50	08/29	St111	Present	greatest	edT :an	eak Numbe	(3)
Ring-Milled Cull Porster's Term Black Term	Previous	05/20 05/20	150	08/29	Stan Stan Stan	Property Property	last refu	The	Ast Seen:	(4)
counts,	and actual			7		Present			gollouh.	
			-						-0.00	

(1)	12	2)	(3	NATORY E	TTM - (4	4)		(5)		A (6)
II. <u>Doves and Pigeons</u> :	Jangosk	ođto	erfowl)	than wat Months	(other				rleR	Nov. 1945
Mourning dove	1	05/20	20	08/01	St.111	Present				Ever Harris
White-winged dove			(4)		(8)		(2)		(1)	
IstoT noitoubo	9	пое	Last 4		Peak Nun	пое	First S	12/3	pecies	2
IV. <u>Predaceous Birds</u> :	Number 'olonles'		Number	Date	Number	Date	redmuM		ешай лош	Cer
Golden eagle Duck hawk Horned owl Magpie Raven Crow		Protect Protect 05/20	#1423 #1423 #1423	20\80 70\70 05\80	700	Activit of GS\20 4S\20	sociores S L	Binds:		I. <u>Water</u> Om Be Be
Hareh Henk	1	06/10	7.2	08/29	Stall	Present		di material	edogG ber logg gest tottotes	
			A EDGE :	42/00		68(0)		astrol	outs de	
						Reported	l byRob	art L. Bar	rber	

INSTRUCTIONS

(1) Species:

Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gavilformes to Ciconiiformes and Gruilformes)

II. Shorebirds, Gulls and Terns (Charadriiformes)

III. Doves and Pigeons (Columbiformes)

IV. <u>Predaceous Birds</u> (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-17	5	1
Form		NR-1A
(Nov		1945)

MIGRATORY BIRDS (other than waterfowl) Months of to 195

Refuge Pable

(1) Species	(; First	2) Seen	Peak N	3)	Last	1) Seen		(5) Production	rob baynia	(6) Total	
5500103	11150	Joon	I CUR IV		Last	Doon	Number	Total #	Total	Estimated	
Common Name	Number	Date	Number	Date	Number	Date	Colonies'	Nests	Young	Number	
I. Water and Marsh Birds:						14124	*		elgae alva	Golden Duck h	
Common Loon Red-mesked grobe Eared grobe	Provices	period	30 30 100	9/5	30 35	30/3 9/5 10/3			Iwo.	bentoH siggsH sevaH word	
Western grebe			15			•					
Pied-billed grebe Greet blue heron		***	100		- 3	9/3		e e e	W. D. A. S.	ety 2017	
						100,72.76	edite specific				
201 4 7	yo	befroge									
				SMOTI	INSTRUC						
I. Shorebirds, Gulls and		ei ,tai.b	O.U. Chec	A said ad	bnuol es		strep edd		rimatoes		
Terns:	noidibbs.	albte itanget s	"tern". Nurion to	esuler	es estes		nlovA .h				
Semi-palmated player	Provious	The second second	nevisled	9/5	2.500.3750	9/5			1 5 1 1 1		
RUldeer		10101010	100	TALL WITH	erisW+CL	12/5					
Coumen andpo	ollimbers	no member	85	De reint de	rade til.	10/18					
Greater pallerlegs	· (a	ente l'ant	300		100	9/5					
leaser yellewless	Lightia	senesi inc	150	AN AUTO	150						
Lonet sandpiper Dowltoher	7 100000	nos Projess	10		10		let Jeti		THE SHEET		
Western sandpiper	•	•	10	•	10						
California gall	lo levisi	ni Gotini	25	00000 80.	caga \$10	10/3	J'assinst;		edgoN Xa		
Ring-billed gull			30	•	5						
Perster's term	moomed		10	B 80 80 000	15	9/5	plet feel		TIMES SEE		
counts	Labros br	a kabira	real/of no	Beend bed		ov to the					
				(over)							

	(1)	_ (;	2)	(3) B YROTA	DIM (4	1)		(5)	1	(6)
II.	<u>Doves and Pigeons:</u> Mourning dove	Previous	period	19	9/5	15	9/5		M. 1	Rofa	1945)
	White-winged dove	Prod	nee	(4) Last S	ered	Pask Nus		(2) Firet 3		(1)	
	miles Intel Estim		nate n								
٧.	Predaceous Birds: Golden eagle Duck hawk	3	11/17	3	11/17		12/5	Teamus	:mbnli	awall not	E_TaleW
	Horned owl Magpie Raven Crow		275.22 25 .3	# 05 #7	200						
100	Morah hank	Previous	period	9	9/5	1	12/5	18			
							Paranta	d hu		Barber	

INSTRUCTIONS

(1) Species:

Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gavilformes to Ciconiiformes and Gruilformes)

II. Shorebirds, Gulls and Terns (Charadriiformes)

III: Doves and Pigeons (Columbiformes)

IV. <u>Predaceous Birds</u> (Falconiformes, Strigiformes and predaceous Passeriformes)

grand foots

(2) First Seen: The first refuge record for the species for the season concerned.

. . . .

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1750b Form NR-1B (Rev. Nov. 1957)

UNITED STATES DEPARTMENT OF THE INTERIOR FISH AND WILDLIFE SERVICE BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Pablo			For 12	-month period	ending Augu	st 31, 19 60					
Reported by R	obert L.	Barber	Title	itle Assistant Refuge Manager							
(1) Area or Unit	Hab	2) Ltat		(3)	(4) Breeding	(5)					
Designation	Туре	Acreage		Use-days	Population	Production					
	Crops Upland Marsh Water Total	175 495 1.292 580 2.542	Ducks Geese Swans Coots Total	1.313.585 60.774 182 156.765 1.531.306	134 6 0 20 160	228 15 0 42 285					
	Crops Upland Marsh Water Total		Ducks Geese Swans Coots Total								
	Crops Upland Marsh Water Total		Ducks Geese Swans Coots Total								
	Crops Upland Marsh Water Total		Ducks Geese Swans Coots Total								
180	Crops Upland Marsh Water Total		Ducks Geese Swans Coots Total								
	Crops Upland Marsh Water Total		Ducks Geese Swans Coots Total								
3.875	Crops Upland Marsh Water Total		Ducks Geese Swans Goots Total	116							

(over)

Refuge Pablo His

Months of James

to April

, 19 69

(1) Species	(2) Density	(3 You Produ	ing	(4) Sex Ratio	R	(5) emova	ls	(6) Total	(7) Remarks	
Common Name	Cover types, total acreage of habitat		Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Restocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
ing-necked phenent 442 phenent 642 fautos et		enoug eneral land, sed in submitt e arem	taile the lture	be d sour gric yabo Fi ativ	ypes should nch as to of reverting s ndard type s re possible, on represent reas should	sods Sta I who ents		eeqy, in bu brai is ar ind bi in ar inple	200	Few observations this period
edune	o fautos ins encits					THOTE	20 11	daun	bedsmiled	(3) YOUNG PRODUCING
no ad	s, etc. Include d	nessan	leny p	est E	arily to wil le.	pris dlab	soli	n app	This colu	(A) SEX RATION
	the report period.	during	bevon	er yn	each catego	al v	numbe	Lado	Indicate 1	(5) REMOVALE:
ay n seasons,	ort period. This a	the rep	ne in	age d grati	sing the ref lus those mi	g ab	faun Lid d	total side	Estimated include p	TOTAL:
Also	covered in survey.	seta b cally i	ion ar pecify	falut a for	determine po information		used ertir	ethod her g	indicate a	(7) REMARKS:
								7	*	
				bead	ed bluods be	Tevo	o bob	teq s	is of elden	* Only columns appli
1445							P _R			

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1)	SPECIES:	Use correct common name.				
(2)	DENSITY:	Applies particularly to tho	se specie	s considered		ublic
		Pertinent infor specifically r List introducti	hunts, etc.). Detailed dat numbers. Density to be expr information is to be prefac number of acres in each cov information need not be rep	a may be ressed in sed by a ser type for eated exc	omitted for acres per an tatement from ound on the ept as signi	species occurring in limal by cover types. To the refuge manager as refuge; once submitted, ficant changes occur in	mited his to the this the area
alz			of cover types. Cover type information but not so much swamp, upland hardwoods, regrass prairie, etc. Standa No. 7 should be used where observations and counts on size of sample area or area	as to obverting a rd type s possible. represent	scure the ge griculture la ymbols liste Figures su ative sample	neral picture. Example and, bottomland hardwood in Wildlife Management bmitted should be based areas. Survey method	s: spruce ds, short t Series on actual
(3)	YOUNG PRODUCED:	Estimated number of young p in representative breeding		based upon o	oservations and actual o	counts
(4)	SEX RATIO:	This column applies primari other species if available.		d turkey, pho	easants, etc. Include	lata on
(5)	REMOVALS:	Indicate total number in ea	ch catego	ry removed di	ring the report period.	•
(6)	TOTAL:	Estimated total number using include resident birds plus				
(7)	REMARKS:	Indicate method used to det include other pertinent inf				Also

^{*} Only columns applicable to the period covered should be used.

Refuge Pablo

Months of_

to

May

August

19 69

(1) Species	(2) Density	n al b	(3) Young Produced	(4) Sex Ratio		(5) emova		(6) Tot a l	(7) Remarks
Common Name	v cover types. This	Acres per Bird	Number broods obs'v'd. Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
, short Series n actual	d should be based o	ubad tte	0 75	yes should reherting a ndard type s e possible. on represent eas should	Star whe ata	not not ardwe etc, used d cou	ypes, n but and h rie, ld be ns an	observatio	Few observations
	tions and actual co			ng habitat,	lbes	nd av	Liado	in represe	(3) YOUNG PRODUCED:
no sa	m, etc. Include da			. 3.	daLi	avs 1	les i	other spec	(5) REMOVALS:
ay n seasons.	ort period. This m singe during certai	the rep o the r	ge during rating int	fler edt goi jim eadt su	u te q al	davn wid 1	Ledod siden	Estimated include re	
Also	covered in survey.	d area cally r	ns noljelu Plicedu ja	etermine pop	od das	used artin	sthod ner p	Indicate m	(7) REMARKS:
			been	ed bluoda b	neve	n bol	zed e	sable to th	● Only columns appli
tial			9						

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1)	SPECIES:	Use correct common name.
seups	DENSITY: modai daenidae9 myllsolliosqa pidoubouni dali	Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited humbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area
8	For observation	of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
(3)	YOUNG PRODUCED:	Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
(4)	SEX RATIO:	This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
(5)	REMOVALS:	Indicate total number in each category removed during the report period.
(6)	TOTAL:	Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
(7)	REMARKS:	Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

^{*} Only columns applicable to the period covered should be used.

3-1750 Form (-2 (April 1946)

Pablo

Refuge_

UPLAND GA BIRDS

Months of September

(1) Species	(2) Density	You Produc	ng ced	(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks		
18	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Restocking	For Research	Estimated number using Refuge	Pertinent information specifically reduction	quested.
phoasentuios	dcture, Examples: ttomland hardwoods lbmless, c. 661 should be based on Survey method use Remarks,	neral pand, both to the witten bomitten both witten	the ge ture l liste res su sample	iure icul ibola Ngv	th as to observe the second type syntax type syntax type syntax type syntax that the second type secon	ds, Stan wher	rdwod to. used cour	nd haie, the day of the second he	grass prais No. 7 shoul observation		
eðn	dons and actual cor	bserva	noqu	sed	produced, b g habitat.	gnuo	of j	number tati	Estimated n in represen	YOUNG PRODUCED:	(3)
a on	, etc. Include da	easantı	ey, pl	turi	rily to wild s.	rima labl	les j	appî Li se	This column other speci	SEX RATIO:	(7)
	the report period.	uring	bevo	y rec	each categor	ni ·	tedmu	tal :	Indicate to	HEMOVALS:	(5)
Seasons.	rt period. This m riuge during certain	ne rep	ring g int	ge dy rati:	ing the refu us those mig	er us lg s	numbe bir	otal iden	Estimated include rea	:JATOT	(6)
Also		area ally r	on and	dalı da do	etermine pop nformation n	to od	used rtin	thod er p	m ejacibnī Do ebuloni	REMARKS:	(7)
				used.	d should be	arev	o bo.	per	able to the	nly columns appli	*
1613											

Pablo

Refuge

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

	(1)	SPECIES:	Use correct common name.	(4)	Young (3)	(2)		(1)
	(2)	DENSITY:	Applies particularly to the	se species		in removal programs (pu	blic	Space
n not	atio ques	Pertinent information specifically recinited introduction	hunts, etc.). Detailed dainumbers. Density to be exprinted information is to be prefaction number of acres in each coninformation need not be reported.	ta may be or ressed in acced by a statement of the control of the	nitted for and tement from the country on the country of the count	species occurring in lim imal by cover types. Th m the refuge manager as refuge; once submitted, ficant changes occur in	ited is to the this the area	Common
			of cover types. Cover type information but not so much swamp, upland hardwoods, regrass prairie, etc. Standa No. 7 should be used where observations and counts on size of sample area or area.	n as to observerting agrand type sympossible.	cure the genericulture lands listed Figures sultive sample	neral picture. Examples and, bottomland hardwood in Wildlife Management bmitted should be based areas. Survey method u	: spruce s, short Series on actual	on-gain phone
	(3)	YOUNG PRODUCED:	Estimated number of young prin representative breeding		ased upon of	bservations and actual c	ounts	
	(4)	SEX RATIO:	This column applies primariother species if available.		turkey, pho	easants, etc. Include d	ata on	
	(5)	REMOVALS:	Indicate total number in ea	ch category	removed di	uring the report period.		
	(6)	TOTAL:	Estimated total number using include resident birds plus					
	(7)	REMARKS:	Indicate method used to det include other pertinent inf				Also	

^{*} Only columns applicable to the period covered should be used.

3-175 Form NR-4 (June 1945)

SMALL MANLALS

Refuge Pablo HAR

IMSTRUCTIONS Year ending April 30, 1969

(1) Species	(2) Density			es c						(4) tion of		rrneds	(1)	(5)
ok of North	found in the "Field Be			eurr	tlup nl s	ray a	el, g	Share	Trapp	ping	Refuge Shipped	Donated		Total Popula
Algorithm gulfale	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control	For Re- stocking	For Re-	Permit Number	Trappers Share	Refuge	Total Ref Furs Ship	Furs Done	Furs Destroyed	tion
end of	Cressband, Groy & L	ent from	ates	te s	gd B	scale	be m	of at n	13					Koderate
had 2 2 hour	n the refuga once sulpt as significant char	Access to	west	TAT	on do	an ni	STOR	a 20 medi	eur letă					Rodonste
kriged Skusk	uguone hariaten ed bi:	mus sed	3 7	COVE	.88	day a	\$400	to sers	102.0					Moderate
rdger	to obscure the general	a norm	e d	on to	rd no	tiemz eve e	infe	desired unples:						Low
Southers Court	Standard type symbol used where woselble.	e, etc. hould b	TIS	is pr	era erie	short ent S	ods. nages	d bardwo	al W					Low
	ons and counts on repr							ted shou						lioderate
or days to	histor & Hersh 1807 A				.83	Remar	nder	belsol.	ini					36
CANCE TAMERA VIOVA	Grassland, Hay & Crop	on the	aka	e ym	anl	nclud	ar,	vious ye	ad		ES:	CVONE	(3)	Hoderate 2
nd refuge share. sken by Service use of unprime-		mun fim m of ba does lo	tsq qin atl	the ts e	list f pel ber d	fure ber o	epped e nus Tota	share-ta icate th gonnel.	nO ti sml seq	DE EO	MOITI		(4)	2
	Predator Animal Hunter	Av A fe						s od bin						

Indicate inventory method(s) used, eize of sample area(s), introductions, and any other pertinent information not specifically requested.

Robert L. Earber

Reported by

INSTRUCTIONS

Year ending April 30.

Managattion of Bure

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

SHALL MAN.ALS

(1) SPECIES:

Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)

(2) DENSITY:

Applies particularly to those species considered in removal programs.

Detailed data may be omitted for species occurring in limited numbers.

Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture.

Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) REMOVALS:

Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headingslisted.

(4) DISPOSITION OF FUR:

On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.

(5) TOTAL POPULATION:

reducit ... Jundel

Estimated total population of each species reported on as of April 30.

REMARKS:

Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

INTERIOR -- PORTLAND DREGON

3-1758 Form NR-8 (Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge	lo	1		County					Montana	
Cultivated		ittee's Harvested		rnment's Sl		Return	Total	Green M	anure, and Water-	6
Crops Grown	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons	Acreage Planted	fowl Browsing Crops Type and Kind		Total Acreage
	Tou - Babon mader, Griff Mader, Griff	ond gainer ma egono e maina dunin mana dunin	ectoesa by	To december to the control of the co	Athr , yad b	Special Heran Robert Heran Robert Heran Robert Heran	prink benaha Hong grava R bangea M	tor gare d		P TO MEN.
	reported and	o crop :	On p. Will bown and	All permi	s are i	ssued and Indian Af	all receip airs, Rona	is are re i, Nontes	ocelved m	THE SECOND
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	recent of	thad crop	deg - pep	nted for recipies to labia to	day jawa Tawa Tawa	ALL STREET		Fallow	Ag. Land	10 CONT
o. of Permittees:	Agricultur	al Operatio	ons	Tot Usite a rec a familiar or a side L was ab	Haying	Operations			Ag. Land	
o. of Permittees: Hay - Improved (Specify Kind)	Agricultur Tons Harvested	al Operatio	Cash Reven	A SECULIAR S	Haying	Num				ACREAGE
Hay - Improved	Tons	18 48	Cash	iue	a (E E	Num	ber mals	_ Grazin	g Operations	6 A .
Hay - Improved	Tons	18 48	Cash	1.	RAZING	Numi Anii	ber mals	Grazin	g Operations	ACREAGE
	Tons	18 48	Cash	1.	Cattle Other	Numi Anii	ber	Grazin AUM'S	Cash Revenue	ACREAGE

DIRECTIONS FOR PREPARING FORM NR-8 CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

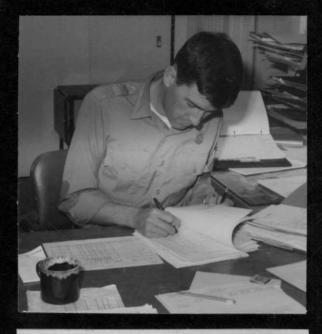
Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under <u>Cultivated Crops</u>, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.



Marvin R. Kaschke, Refuge Manager



Robert L. Barber, Asst. Manager



Victor B. May, Foreman II



Grant Hogge, Heavy Duty Mechanic



Ernest W. Kraft, Maintenanceman III



Edward G. Krantz, Maintenanceman I (WAE)



William J. Lampshire, Maintenanceman I (WAE)



Robert L. Middlemist, Maintenanceman I (WAE)



This piece of equipment was our most valuable property during the months of January and February. Kaschke



January's record snowfall became a problem when we ran out of places to push it. May



One of our "white-face" buffalo. Bison do not paw for their food as most other animals do; instead they nose it out with their faces. May



Snow machines were successfully used to drive buffalo to new pastures in January. Barber



Heavy Duty Mechanic Hogge clips the hair and sprays buffalo calf for ticks. Barber



Engorged ticks on the neck of white-tail deer found during the tick paralysis outbreak in April. Barber



This $4\frac{1}{2}$ year old female Bighorn sheep was overdrugged and sent to Bozeman for autopsy. Results were Malignant Melinoma. Notice the malformation of the jaw. J. Stelfox (top), Kaschke (bottom)





Refuge personnel are frequently required to perform minor veterinary jobs. Foreman May drains an abscess on a yearling buffalo. Barber



Five African students from various universities in the U.S. enjoyed a tour of the Bison Range. Most were Engineering majors and were impressed but scared of the animals. Kaschke



Public use was up 13% to 79,400 individual visits. Some 33,800 people enjoyed the 19 mile self-guiding tour. The Red Sleep Mountain viewpoint is one of the highlights of the tour. Kaschke



Over 200 horses and riders took the annual Saddle Club tour of the Bison Range. Barber



Goatweed spraying is an annual maintenance problem. Unfortunately the beetles did not do the job. The helicopter has proved the most economical method of accomplishing the job in our rough terrain. May



Operation of the Bureau rock crusher, transferred to a site near the Bison Range for J.C.C. training, was inherited by Refuge personnel. The crusher is small but produces approximately 25 cu. yds. of gravel per hour. Kaschke



The office received a new "lid" in April. May



This old surplus wood shed constructed in 1919 was torn down in August of 1969. Barber



Surplus quarters #3 was sold by sealed bid for \$154 and moved near Charlo. May



The former clerk residence quarters #2 was sold for \$76.00 and moved to Charlo. Kaschke



This water fountain was found efficient and aesthetically acceptable for our picnic area. May



Cattleguards on the tour route were widened to 16' to prevent buffalo from jumping. Kaschke



The annual cooperative State, GMA and Refuge goose banding operation produced 185 geese banded. Kaschke



The Student Trainee had a "run-away" this summer. The vehicle was left in high gear without the hand brake set. It rolled off the road and turned over in a coulee. Kaschke

The annual bison round-up was the subject of numerous newspaper articles. The AP release by Steve Moore (opposite page) was carried from coast to coast. Following is a list of newspapers in which we are aware that the article appeared:

Long Island Press Grit Washington Post ????? Stars and Stripes Star Herald Newstime Scholastic Paper Daily Banner Worl Herald News Press Los Angeles Times Hungry Horse News The Missoulian Billings Gazette Lewistown Daily News The Oregonian Independent Press Telegram Yakima Herald Republic Idaho Statesman Fresno Bee Mission Valley News Great Falls Tribune Eugene Register Guard Columbus Dispatch St. Louis Dispatch

Long Island, New York Williamsport, Pennsylvania Washington, D.C. Jonesboro, Tennessee European Edition Scottsbluff, Nebraska San Francisco, California Cambridge, Maryland Omaha, Nebraska Santa Barbara, California Los Angeles, California Columbia Falls, Montana Missoula, Montana Billins, Montana Lewistown, Montana Portland, Oregon Long Beach, California Yakima, Washington Boise, Idaho Fresno, California St. Ignatius, Montana Great Falls, Montana Eugene, Oregon Columbus, Ohio St. Louis, Missouri



NATIVE BREED: A group of bison thunders into an enclosure during the annual roundup at the National Bison Range in Montana. The

herd numbers about 400, although when it was established in 1909, the magnificent native animals were almost extinct.

Montana's Big National Bison Range Gives Buffalo Plenty of Room to Roam

They came over the hill from were sold alive to predeterbooks—coughing, snorting, and erage price of \$368.48. butting, running full bore for a fate unknown.

Their cloven hoofs sounded like a running river. The ground vibrated. The nine riders, silhouetted against the morning sky, pushed them on.

It was roundup time at the National Bison Range at Moiese, an 18,541-acre chunk of Western Montana where every year a page of American history is relived.

Judge Beasts

The "whoa, whoa, juh-hah" cries of the buffalo drivers could be heard long before the first black speck appeared on the range half a mile from the corrals where the shaggy beasts would be judged.

Some would be sold for slaughter, others to build private herds across the nation. The remaining animals would be put back on the range for another year.

There were 150 head in the first bunch pushed into the holding pasture. An equal number thundered over another hill the next day.

Seventy-nine of the animals

the west, just like in history mined sealed bidders for an av-

The national wildlife refuge is nestled in the forested valley of the Flathead River near the middle of the Flathead Indian Reservation. It was established May 23, 1908.

The bison range was created at a time when the herds -once numbering 40,000,000 to 60,000,000 animals—had dropped to an all-time low of 20 known wild buffalo in 1900.

The first buffalo were released on the range in October, 1909, there to roam with their lifelong companions—elks, antelopes, big horn sheep, whitetail and mule deer, golden eagles, and other birds.

Balance Herd

Through natural attrition and sale, the herd is kept at about 325 bulls and cows and roughly 75 calves, officials said. The herd could be much larger, but surplus animals are thinned out to keep a balance with the available food supply.

The work was hard for both men and horses. But riders and others joked and found time for horseplay during the slack periods.

One explained there really is a difference between buffalo and bison.

"Those shaggy beasts out there are buffalo," he said. "Then what are bison?" was

the naive reply.

"That's what an Englishman washes his hands in."



COUNT: During the annual bison roundup in Montana, a metal ear tag and a numbered rump tag are attached to each animal in the herd. This is a federal requirement for interstate transportation of buffalo.